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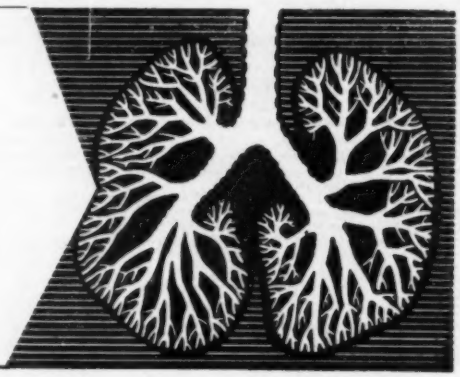

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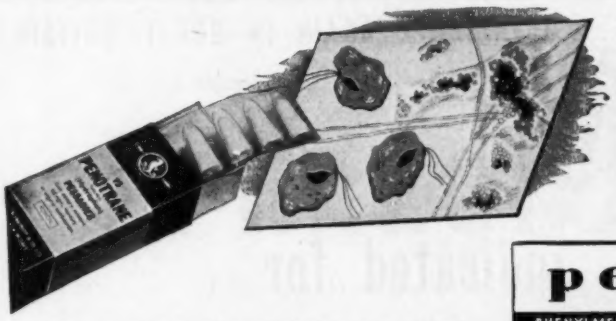


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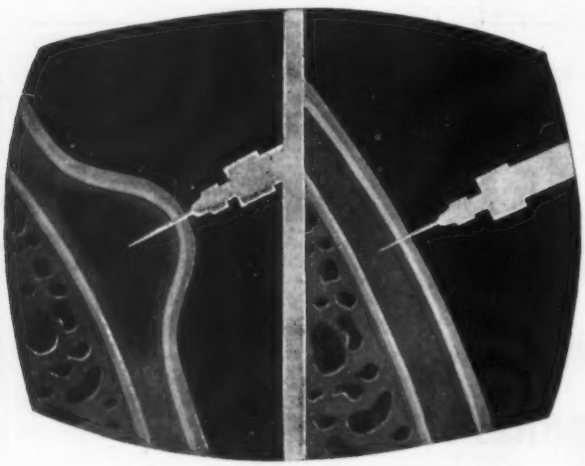

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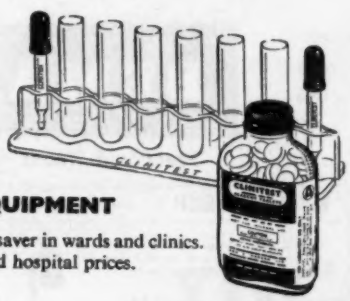

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(1954) 'Clinical Tests for Ketonuria', *'Lancet', July 10th, p. 95*

**AMES COMPANY (LONDON) LTD.**

*Sole Distributors for the United Kingdom and Eire:*

**DON S. MOMAND LTD., 58 ALBANY STREET, LONDON, NW1**

The richest natural vitamin-protein-mineral supplement, Bemax provides easily digested nutritional support for patients of all ages. Now available in two forms — Plain and Chocolate Flavoured.

**BEMAX**

***Stabilized Wheat Germ***

**PREGNAVITE** *during Pregnancy*

vitamin-mineral supplementation is obtained by routine administration of PREGNAVITE. It is designed with maternal dietary requirements specifically in mind.

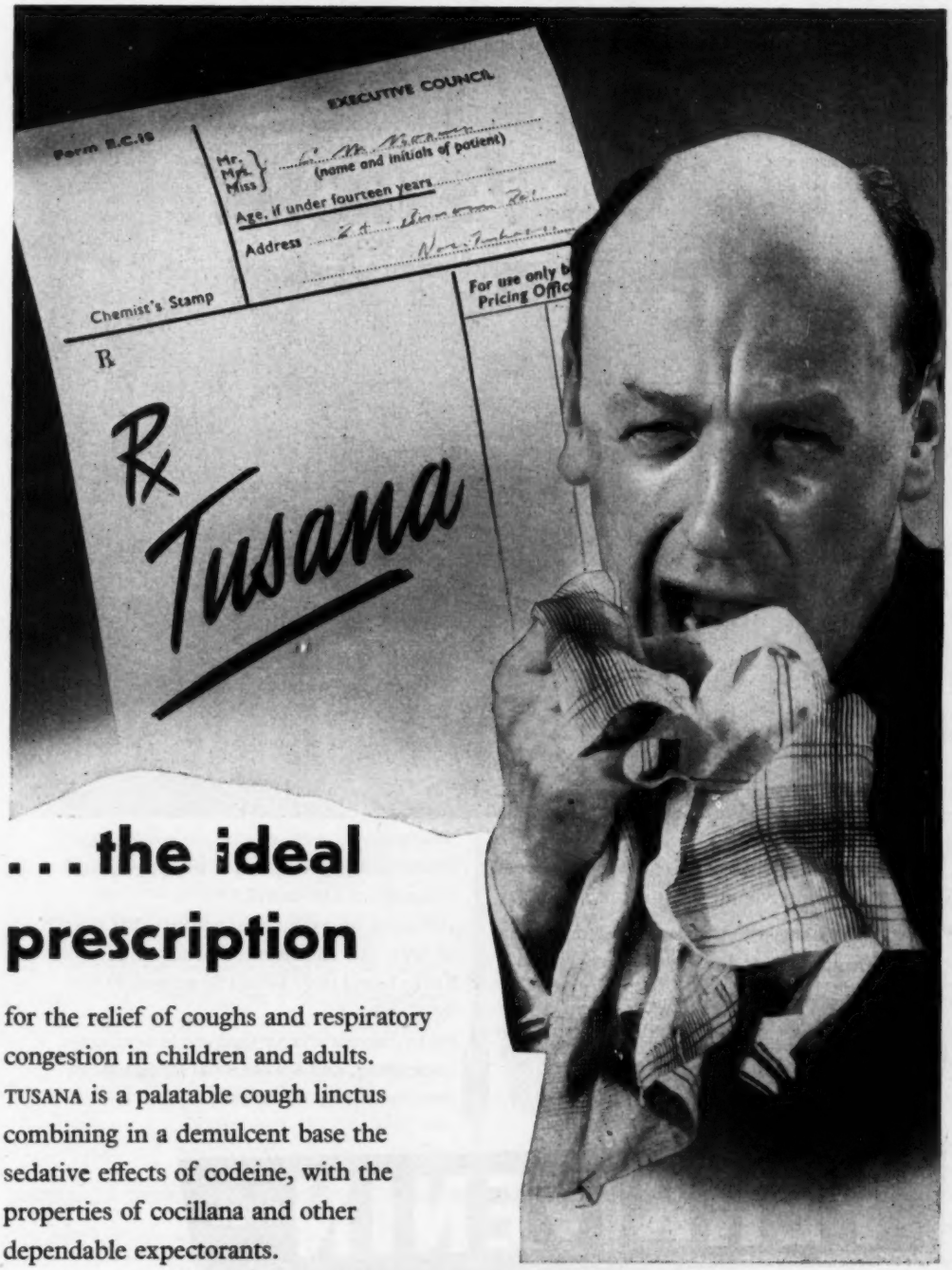
*Basic price to N.H.S. 1,000 tablets* . . . **32/9**

**VITAVEL SYRUP** *for the child*

vitamin supplementation so palatable as to ensure regular dosage is provided by VITAVEL SYRUP.

*Basic Price to N.H.S.* { 6 fl. ozs. . . . **2/6** ; 40 fl. ozs. . . **16/-**

**VITAMINS LIMITED** UPPER MALL, LONDON W.6




# . . . the ideal prescription

for the relief of coughs and respiratory congestion in children and adults. TUSANA is a palatable cough linctus combining in a demulcent base the sedative effects of codeine, with the properties of cocillana and other dependable expectorants.

# TUSANA

Basic N.H.S. Prices 20 fl. oz. 8/4d. 80 fl. oz. 30/-.

*Further information will be gladly sent on request.*

BOOTS PURE DRUG COMPANY LIMITED NOTTINGHAM

Boots

8229 9

# INTRAVENOUS IRON...

WHEN THE INTRAVENOUS route is preferred, Ferrivenin commends itself because:

* The absorption and utilization of its iron content are virtually total.
* The response in true iron-deficiency anæmia is related directly to the amount given.
* Since its introduction in 1947 it has enjoyed the confidence of physicians throughout the world.

AMPOULES OF FERRIVENIN contain 100 mg. of iron (as saccharated iron oxide) in 5 ml.: boxes of 5, 10 and 50 ampoules are available.

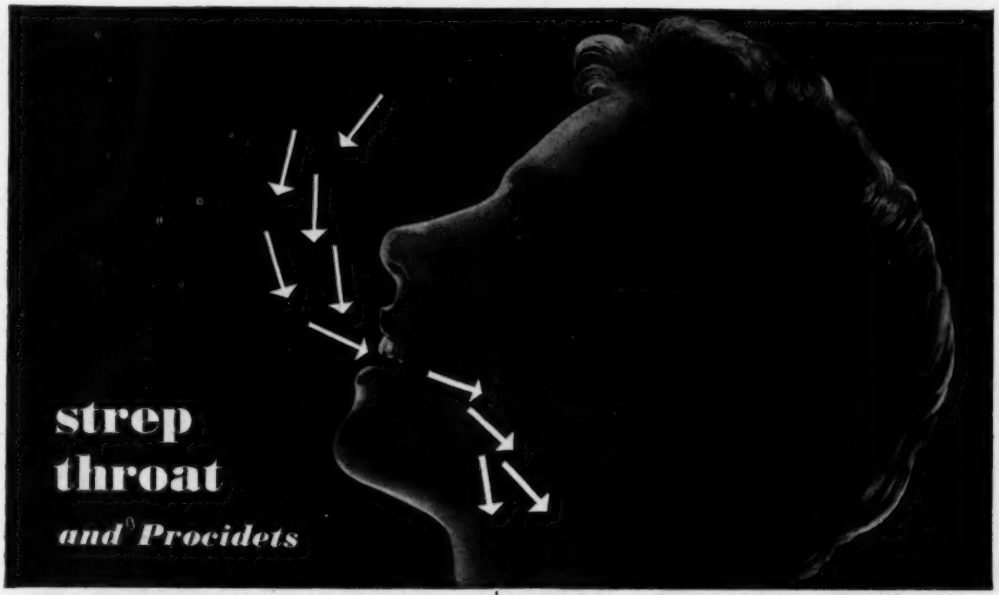
FULLY-DESCRIPTIVE LITERATURE is available on request, and a Technical Information Service is at your disposal.

# FERRIVENIN REGD

L.2.

BENGER LABORATORIES LIMITED · HOLMES CHAPEL · CHESHIRE

A BENGER PRODUCT




## *New research on Procidets proves their amazing effectiveness in the treatment of streptococcal and other throat infections*

Newly evolved techniques have convincingly established the value of PROCIDETS in practice.

It has been demonstrated that four Procidets sucked in succession destroy most of the bacteria and fungi in the mouth.

PROCIDETS were evolved to obviate the danger of undesirable use of antibiotics, which develops resistant strains of bacteria—a danger now generally recognised.

PROCIDETS are fully effective against bacterial and fungal infections of the throat and mouth and yet contain no antibiotic. They are non-toxic and cannot build up resistant strains.

## Procidets v Penicillin

*Comparitive effect on ORAL BACTERIA*

*Before* *After 1 Procidets* *After 4 Procidets*

These photographs are of representative plates showing the dramatic action of Procidets in comparison with Penicillin Lozenge B.P.

*Before* *After 1 Penicillin Lozenge B.P.* *After 4 Penicillin Lozenges B.P.*

*Each 1 gramme lozenge contains :*

| | |
|---|---|
| *Cetyl Pyridinium Chloride* | *4 mg.* |
| *Sodium Propionate B.P.C.* | *100 mg.* |
| *Benzocaine B.P.* | *5 mg.* |

*Cartons, 18 lozenges, metal foil sealed pack.*
*Retail price 2/4 (incl. P./tax).*
*Basic N.H.S. cost 1/4 per carton.*
*Also available dispensing pack 498 lozenges for N.H.S. patients PROCIDETS prescribable on Form EC10.*
*Classification category 3/4.*

Procidets

*Literature and samples on request*

**HARKER STAGG LTD · LONDON E.1**

*Stepney Green 2022*

## The basis of reliable remedies for dyspeptic disorders

For many generations bismuth salts have been used with notable success in the treatment of peptic ulcer and allied dyspeptic disorders. The bismuth salts used for this purpose include the carbonate, the subnitrate and the hydroxide, in the form of powder, tablets and mixtures.

The great value of bismuth salts cannot be accounted for on the criterion of antacid power since none of them is capable of neutralising a large quantity of hydrochloric acid. The established properties of bismuth are (a) protection of the gastric mucosa and (b) correction of abnormal peristalsis. Recent investigations have shown that the bismuth ion is capable of inactivating pepsin regardless of pH. Such action prevents autodigestion of the base of the ulcer and renders hydrochloric acid far less noxious.

Although bismuth has been widely applied for so long, research into its properties continues, for it is believed that the convincing clinical success of bismuth preparations is dependent in part on one or more properties as yet undetermined.

# BISMUTH RESEARCH

DEPARTMENT

MINING & CHEMICAL PRODUCTS LTD. 86 STRAND, LONDON W.C.2. Tel. TEMPLE BAR 6511

Ref:
Anaemia of Pregnancy

Tel. 8251-5

**CREWE**
**CHESHIRE**

## FERROMYN (Ferrous Succinate)

Until recently the fall in haemoglobin during pregnancy has been regarded as a natural phenomenon due to haemodilution and foetal iron requirements, particularly in the latter stages of pregnancy, which may give rise to an iron deficiency state in the new born.

That this so-called "physiological anaemia" of pregnancy, attributed to the rise in blood volume of 18% to 23%, can be circumvented by the administration of iron has been ably demonstrated*. The choice of a readily assimilable iron preparation as a source of supplementary iron in pregnancy is highly important, in that it should be well tolerated by the expectant mother throughout the whole period of gestation.

In a recent controlled clinical trial of 150 cases suffering from iron deficiency, 52 were anaemias of pregnancy. All these cases were treated with the new organic iron FERROMYN - Ferrous Succinate, 1 tablet t.d.s. A notable feature of this clinical evaluation was the complete lack of alimentary upset and the immediate satisfactory response that was obtained.

Although FERROMYN (Ferrous Succinate) has been shown to be of particular value in treating anaemia of pregnancy, the trial clearly shows that it is equally efficacious in the treatment of a wide field of hypochromic states.

The mean daily Hb increase obtained throughout the whole series was 1.2%.

FERROMYN is available for prescription in four forms: FERROMYN Tablets and Elixir; FERROMYN 'B' Tablets and Elixir which incorporate the vitamin 'B' factors.

Medical Information Department

CALMIC LIMITED.

London: **2 Mansfield** Street W.1. (Langham 8088-9)

* *J. Obstet. Gynæc. Brit. Emp.*, **61**, 103. (1954). *Brit. Med. J.*, **1**, 385. (1955). *Med. Illustrated.* **9**. *147.* (*1955*) F3

**RELIEF OF PAIN**
**HYPERAEMIA**
**RELAXATION**

**Response to the percutaneous stimulation of warmth with**

# FINALGON OINTMENT

**in rheumatic and neuralgic conditions**

**tube of 20 g**

COMPOSITION :
Nonylic acid vanillylamide 0.4% and Nicotinic acid-β-butoxyethyl ester 2.5% in a suitable ointment base

**LEWIS LABORATORIES LTD., LEEDS 9**

*For irritating or unproductive cough . . .*

# Syrup Pholcodine

## (DUNCAN)

*morpholinylethylmorphine*

Syrup Pholcodine (Duncan)—a palatable syrup containing 8 mg. pholcodine per teaspoonful—is particularly effective against coughs due to irritation of the upper respiratory tract, pleuro-pulmonary reflex coughs and nervous coughs. Syrup Pholcodine (Duncan) is advantageous in being pleasantly palatable, of greater depressant action than codeine with much less toxicity, and especially in causing no gastric disturbance and in giving no constipation or intestinal constriction.

*Available in bottles of 4, 16 and 90 fl. oz. Further details gladly on request.*

Duncan

**DUNCAN, FLOCKHART & CO. LTD.,**

104-8 Holyrood Road, Edinburgh, 8. 155-7 Farringdon Road, London, E.C.1.

Veracolate is indicated in chronic cholecystitis, for the "bilious attack" and in constipation. It is a cherry-red tablet containing bile salts which encourage the production of normal bile. It also helps to keep the bile freely flowing, and has laxatives added to correct the constipation so often accompanying biliary stasis.

ACTIVE CONSTITUENTS: *Sodium taurocholate and sodium glycocholate, each 1.07 gr., ext. cascara sagrada 1.00 gr., phenolphthalein 0.50 gr., oleoresin capsicum 0.04 gr.*

PACKING: *Bottles 50 & 100 tablets; bottles of 500 for dispensing purposes only supplied at 15/-, exempt from Purchase Tax on prescription.*

**Veracolate**

*No Warner preparation has ever been advertised to the public.*

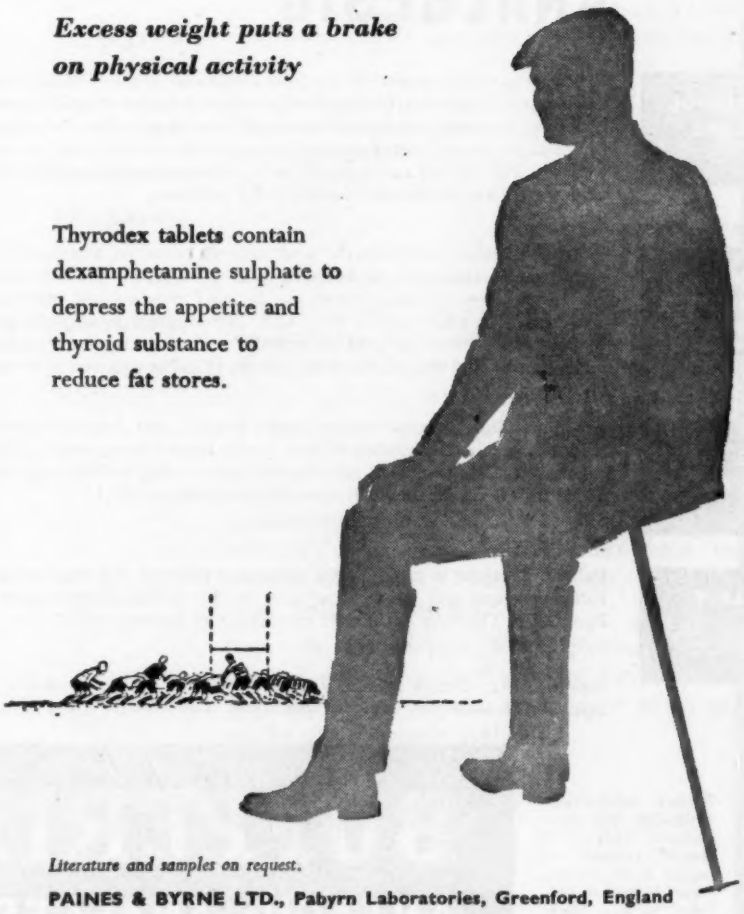
WILLIAM R. WARNER & CO. LTD., Power Road, London, W.4.

*A well-proved formula*

# THYRODEX

## TABLETS

***Excess weight puts a brake on physical activity***



Thyrodex tablets contain dexamphetamine sulphate to depress the appetite and thyroid substance to reduce fat stores.

*Literature and samples on request.*

**PAINES & BYRNE LTD., Pabyrn Laboratories, Greenford, England**

*ASPIRIN INTOLERANCE IN RHEUMATOID ARTHRITIS*

# BUFFERIN-

## THE NEW BETTER TOLERATED ANALGESIC

**A MOST SUCCESSFUL ANSWER TO THE PROBLEM**

Following last year's report[1] by the Joint Committee of the Medical Research Council and Nuffield Foundation, many practitioners have returned to aspirin therapy in place of cortisone. Effective therapy with aspirin and similar salicylates unfortunately has been hampered by the problem of gastric irritation, which affects as many as 42% of arthritic patients. Bufferin, the new analgesic which reduces gastric intolerance to a negligible minimum, is a most successful answer to the problem.

**BUFFERIN FAR BETTER TOLERATED BY ARTHRITICS**

Bufferin combines acetylsalicylic acid with the antacids aluminium glycinate and magnesium carbonate (gentle buffering acids which do not produce "acid rebound"), and is well tolerated even by arthritics. In blind trials amongst arthritics with proven intolerance to ordinary aspirin, 70% had no gastric symptoms after taking large doses of Bufferin over periods of 4 to 16 months.[2] Previous studies amongst the general population showed that only 1 patient out of 238 had any distress after taking 10 grains of Bufferin.[3]

**ACTS TWICE AS QUICKLY AS ASPIRIN**

Not only is Bufferin better tolerated by the stomach than ordinary aspirin, but its pain relieving ingredient is absorbed twice as quickly into the blood stream. Trials show that on an average the 10-minute salicylate level after taking Bufferin was more than 20% higher than the 20-minute level after taking ordinary aspirin.[3]

**NO EQUIVALENT IN BRITISH PHARMACOPOEIA**

Bufferin is unique in incorporating aluminium glycinate and magnesium carbonate as buffering agents and has no equivalent in the British Pharmacopœia or National Formulary. This fully justifies the prescription of Bufferin on E.C.10.

*References:* 1. *British Medical Journal*, 1954, **1**: 1223. 2. *Journal of the American Medical Association June* 4 1955 p. 387. 3. *J. Amer. Pharm. Assoc.* 1950, **39**: 21.

Further information: A detailed, fully documented leaflet and sample available on request to the makers, Bristol-Myers Co. Ltd., Dept. C, 211 Blackfriars Road, London, S.E.1.

**BUFFERIN** TRADE MARK
**ANTACID ANALGESIC**

*Formula: Acetylsalicylic Acid 5 gr.: Aluminium Glycinate ¾ gr.: Magnesium Carbonate 1½ gr.*

# What does the National Formulary say?

In the notes for prescribers the National Formulary 1955 comments on Sulphadimidine B.P. ('Sulphamezathine') as follows:-

**the choice of a Chemotherapeutic Agent**

"Sulphonamides have as advantages a relatively wide range of activity, the oral route of administration, comparative cheapness and, if sulphadimidine is used, a relative freedom from toxic effects especially in short term treatment."

The National Formulary 1955, p.28.

**on Sulphonamide Mixtures**

"Such mixtures are preferable to most of the sulphonamides in common use although it is doubtful if they have any advantage over sulphadimidine."

The National Formulary 1955, p.41.

**on Sulphadimidine itself**

"Sulphadimidine is very active, but probably less so than sulphathiazole or sulphadiazine. It is easy to produce high blood concentrations by six-hourly administration and toxic effects are rare. Both it and its acetyl derivative are relatively soluble even in acid urine. It is probably the best sulphonamide for routine use."

The National Formulary 1955, p.41.

**Sulphadimidine was discovered in the laboratories of I.C.I. and for more than ten years has been marketed by Imperial Chemical (Pharmaceuticals) Limited under the name 'Sulphamezathine'.**

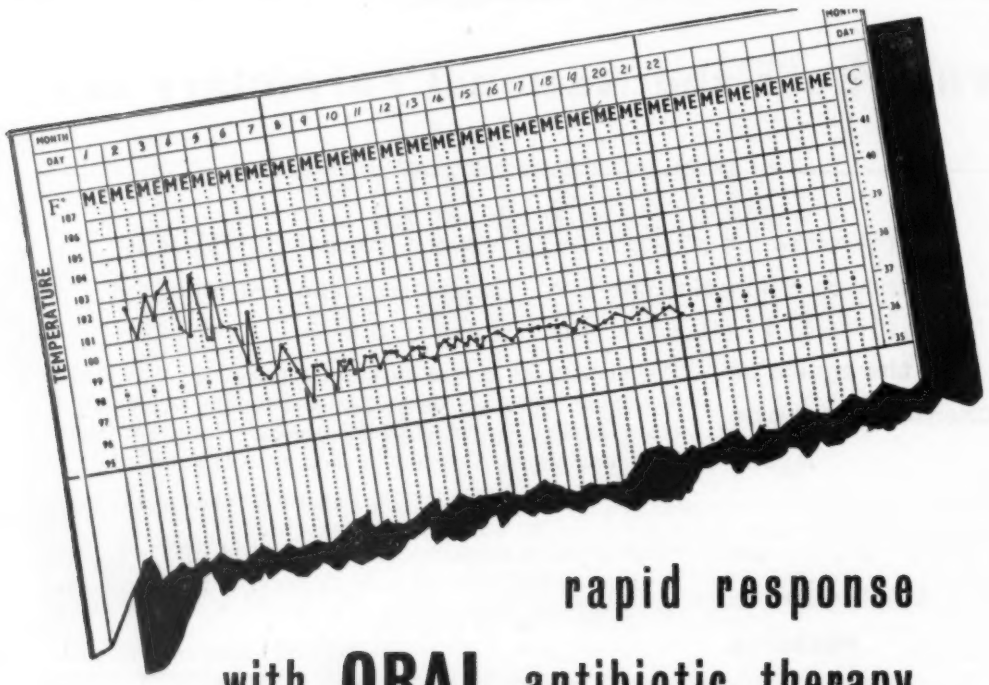
**Note: Our product, prescribed as 'Sulphamezathine' Tablets is supplied at the Drug Tariff price for Tab. Sulphadimidin. B.P. 'Sulphamezathine' remains the cheapest of the 'safe' sulphonamides now commonly available.**

**'SULPHAMEZATHINE'**
TRADE MARK

IMPERIAL CHEMICAL (PHARMACEUTICALS) LIMITED
FULSHAW HALL, WILMSLOW, MANCHESTER
*A subsidiary company of Imperial Chemical Industries Limited*

ICI

Ph.541

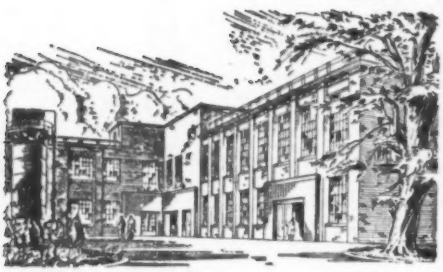



## rapid response
## with **ORAL** antibiotic therapy

Chloromycetin* is unique in being readily and effectively absorbed from the gastro-intestinal tract and producing blood-levels which rise proportionally with increase in dosage. This is a great advantage in severe infections where initially, high blood-levels are essential; a rapid response to treatment is a natural corollary. Owing to effective absorption, gastro-intestinal side-effects following the administration of Chloromycetin are reduced to a minimum.

# CHLOROMYCETIN

*the original Chloramphenicol*



At HOUNSLOW Parke-Davis have one of the most modern plants in the world for the large-scale manufacture of Chloromycetin and other synthetic chemicals.

* *Trade Mark*

**PARKE, DAVIS** & COMPANY, LIMITED, *(Inc. U.S.A.)* HOUNSLOW, MIDDLESEX. TEL: HOUNSLOW 2841
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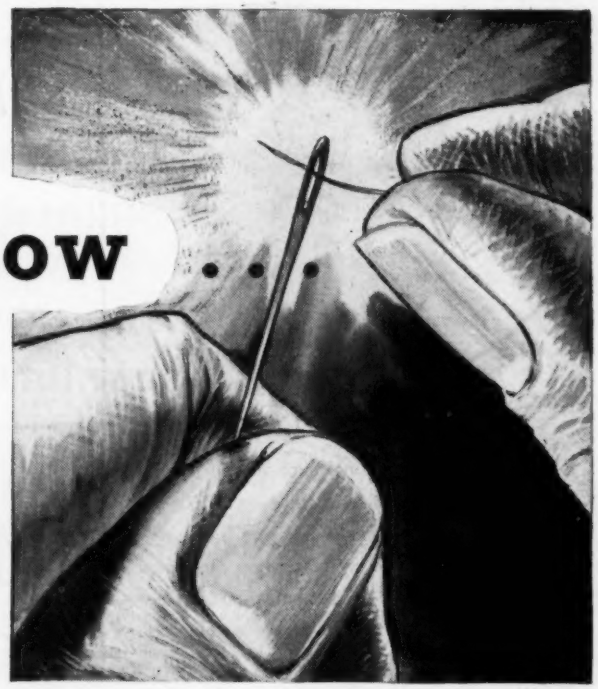
# steady now . . .



The ability of ARTANE to steady the hand and brighten the mind in Parkinsonism has been amply evidenced in hospital and general practice. ARTANE exerts a marked antispasmodic effect which relaxes spastic muscles and, indirectly, aids co-ordination. At the same time, it produces a mild cerebral stimulation and so combats the depression so characteristic of Parkinsonism. It decreases sialorrhoea with little or no accompanying oral dryness. Its low toxicity and relative freedom from side-reactions make ARTANE eminently safe for young and old, the ambulatory and the infirm, the hypertensive, the cardiac and the nephritic.

# ARTANE*

TRIHEXYPHENIDYL

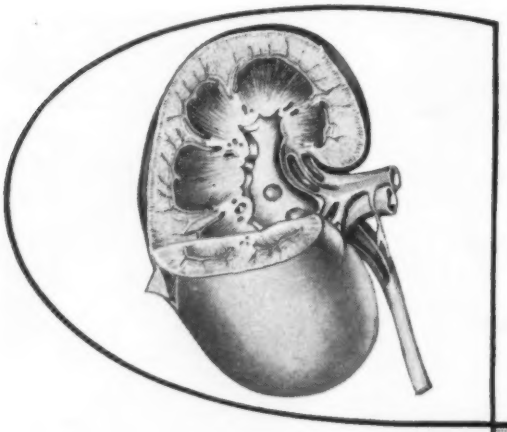
## *promises most in Parkinsonism*

TABLETS: 2 mg. and 5 mg. Bottles of 100 and 1,000
ELIXIR: 2 mg./4cc. 16 fl. oz. bottles

* Regd. Trade mark

Lederle

LEDERLE LABORATORIES DIVISION
*Cyanamid Products Ltd.* BUSH HOUSE · ALDWYCH · LONDON W.C.2. TEMPLE BAR 5411



# SEARLE

*research laboratories*

NOW INTRODUCE

"Mictine," the new non-mercurial oral diuretic, is distinctive in showing no contra-indications. Its mode of action is believed to be by inhibiting resorption of sodium ions by the renal tubules, and neither succinic dehydrogenase nor carbonic anhydrase are involved. " Mictine " is useful in maintaining an oedema-free state in any patient requiring diuretic therapy, and in the *initial* and *continuing* control of patients in mild congestive failure. " Mictine " may also be used for *initial* diuresis in more severe congestive states, particularly where mercurials are contra-indicated.

SEARLE

## Mictine*

TABLETS

***The new oral diuretic for treatment and maintenance of oedematous patients***

Clinical trials with " Mictine " indicate that it is best administered on an interrupted dosage schedule. It may either be given on alternate days, or for three consecutive days followed by complete omission on the following four days. For either scheme the dosage is one to four tablets in divided doses *with meals*. Such side-effects as are occasionally experienced are usually relieved by the interrupted dosage schedules. " Mictine " is available in bottles of 25 and 100 tablets each containing 200 mg. 1-allyl-3-ethyl-6-aminotetrahydropyrimidinedione.

*Literature on request*

*REGISTERED TRADE MARK

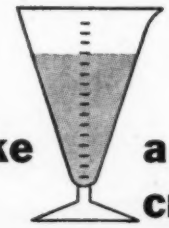
# SEARLE

*Ethical Pharmaceuticals since 1888*

G.D. SEARLE & CO., LTD.

17, Manchester Street
London, W.1.

*Telephone: Welbeck 1306.*



# Take a conventional analgesic cream formula and add

① **a powerful vasodilator** *(Dilatal)*

② **a superior analgesic** *(Propyl salicylamide)*

## and you have

# thermona

TRADE MARK

A new development for the relief of pain in the group of conditions covered by the terms 'muscular rheumatism' or 'fibrositis'.

**The vasodilator** DILATAL (1-(p-hydroxyphenyl)-2-(l'methyl-3'-phenyl-propylamino)-propanol-(1) hydrochloride): a highly vaso-active substance which, when given systemically, produces an increase in both muscle circulation (1) and cardiac output (2) and gives rise to a prolonged hyperaemia of the deep tissues.

**The analgesic** PROPYL SALICYLAMIDE: an analgesic more powerful than other derivatives of salicylamide and salicylic acid (3).

Methyl nicotinate, a superficial rubefacient, facilitates the absorption of the other active substances through the skin and reinforces the effect of Dilatal. Similarly glycol salicylate adds to the analgesic effect of propyl salicylamide.

THERMONA contains the following ingredients: 0.3% Dilatal, 1.0% methyl nicotinate, 5.0% propyl salicylamide, 10.0% glycol salicylate, 83.7% vanishing cream base.

THERMONA is available in tubes containing 20.G. (approx.). It is prescribable on N.H.S. form E.C.10.

**references**

1 *Z. KreislForsch.* 1954, 43, 756

2 *Angiology* 1954, 5, 314

3 *J. Pharmacy & Pharmacol.* 1952, 4, 872

S&N *Further information from Smith & Nephew Ltd., Welwyn Garden City, Herts.*

# 3 new forms of ACHROMYCIN*

TETRACYCLINE

## *Give you wider choice in prescribing*

Here are three new presentations of ACHROMYCIN enabling you to choose precisely the preparation best suited to the patient's needs. The growing popularity of this outstanding antibiotic is due to several merits—not the least of which are its unsurpassed antibacterial range and its remarkable freedom from side effects. Today there is a form of ACHROMYCIN to meet every prescription requirement.

*Regd. Trade Mark

- ACHROMYCIN Troches, 15 mg. Provide rapid and effective control of bacterial infections of the throat and mouth. Bottles of 25.
- ACHROMYCIN Ophthalmic Sterilized, 25 mg. To arrest infection in the conjunctiva and deeper structures of the eye; and to prevent infection in traumatic and surgical injury. Vial of powder with sterilized dropper vial.
- ACHROMYCIN Syrup, 125 mg./5 cc. Ideally suitable for children, convalescents and others unwilling or unable to take ACHROMYCIN in capsule or tablet form. Bottle of 2 fl. oz.

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Cyanamid Products Ltd.

**LEDERLE LABORATORIES DIVISION**

BUSH HOUSE · ALDWYCH · LONDON W.C.2 TEMPLE BAR 5411

ACHROMYCIN antibiotic

# FERLUCON TRADE MARK

# Ferrous Gluconate for the treatment of IRON DEFICIENCY ANAEMIA

**FERROUS GLUCONATE has been shown to be more effective than ferrous sulphate in restoring a normal blood picture and is much less liable to cause side effects especially in the gastro-intestinal tract.**

An investigation (Irish J. Med. Sci. July 1954) showed that 50% of cases of hypochromic anaemia of pregnancy could not tolerate ferrous sulphate because of nausea. Intolerance to ferrous gluconate, however, occurred in only 10%. Comparing the haematological response to the two haematinics the authors found ferrous gluconate to be the better.

**FERLUCON ELIXIR** is particularly suitable for children and infants, and extensive laboratory investigations have confirmed its high stability. Enquiries instituted have so far failed to bring to light any cases of poisoning of children with ferrous gluconate.

**PRESENTATION**

TABLETS OF 0·3G. FERROUS GLUCONATE (EVANS)

BOTTLES OF 25, 100 AND 250 TABLETS

ELIXIR. EACH FL. DR. (3·5 ML.) CONTAINS 0·3G. FERROUS GLUCONATE (EVANS)

BOTTLES OF 4 FL. OZ. (114 ML.)

*Bulk packs also available.*

EVANS MEDICAL

**EVANS MEDICAL SUPPLIES LIMITED**

Speke, Liverpool 19, & Ruislip, Middlesex

553A

## for use in psychiatry

# RESERPINE

**'SERPILOID' BRAND**

Is now available in ampoules, and in tablets of high strengths more suited to administration of the high doses required in the treatment of mental illness.

**Tablets of 1 mg. in bottles of 100 and 1,000, tablets of 3 mg. and 5 mg. in bottles of 100, ampoules of 5 mg. in boxes of 6 and 50.**

Reserpine, an alkaloid of Rauwolfia serpentina, possesses a remarkable calming and relaxing action, and is capable of wide application in mental illness. Its use is rapidly increasing, and if early reports are confirmed, Reserpine will stand as a very real advance in psychotherapeutics.

Reserpine–'Serpiloid' brand is also available in 0.25 mg. and 0.5 mg. tablets in bottles of 100 and 1,000 for those clinicians who prefer a single alkaloid for use in hypertension.

**"The drug (reserpine) provides a far more rational approach to the treatment of the chronically and acutely disturbed patient than any other method we have used to date."**

*See* J. Amer. med. Ass. (1954) 156:821

### 'RAUWILOID'

**brand alkaloid hydrochlorides of Rauwolfia serpentina**

remains available as before, and is the Rauwolfia preparation of choice, either alone or in combination, for all grades of hypertension. Presenting in a refined form the hypotensive activity of reserpine and rescinnamine and other desirable Rauwolfia alkaloids, the unique extraction process ensures elimination of all the undesirable principles. 'Rauwiloid' is standardized and biologically tested.

Rauwiloid is available in 2 mg. tablets in bottles of 60 and 500.

RIKER

'RAUWILOID' and 'SERPILOID' are registered trade marks.

*Regd. Users:*

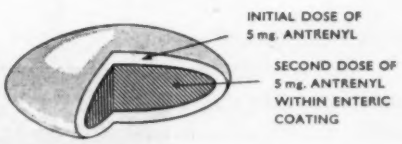
RIKER LABORATORIES LIMITED
MORLEY STREET, LOUGHBOROUGH, LEICS

NEW DEVELOPMENT IN ANTICHOLINERGIC THERAPY

# Antrenyl 'Duplex'

*A SINGLE tablet with TWO PHASES of activity*

DIAGRAMMATIC REPRESENTATION




**Two duplex tablets daily provide four spaced doses for the relief of gastro-intestinal pain, particularly nocturnal pain in peptic ulcer**

10 mg. Antrenyl 'Duplex' tablets in bottles of 25, 100 and 500

*The original 5 mg. plain Antrenyl tablets are still available*

**Antrenyl syrup now available.** Bottles of 100 c.cm.

C I B A

*'Antrenyl' is a registered trade mark denoting*
*β-diethylaminoethyl-α-cyclohexyl-α-phenylglycollate methobromide. Reg. usw.*

CIBA LABORATORIES LIMITED · HORSHAM · SUSSEX

*Telephone: Horsham 1234 Telegrams: Cibalabs, Horsham*

2/5

# *In atonic constipation*

**PURSENNID contains the pure Sennosides A & B of *Cassia angustifolia* in the form of their calcium salts.**

**PURSENNID taken at bed-time, exerts a gentle but effective laxative action on the following morning.**

**PURSENNID does not cause griping, cramps or colic owing to the fact that the active compounds are pure glucosides, constant in quality and potency, and the preparation is free from irritant impurities contained in crude senna preparations.**

**PURSENNID**

***Tubes of 40 and 200 tablets each containing 12 mg.***

*Schweiz. med. Wschr.*, 1941, 71, 1093
*Rev. méd. Suisse rom.*, 1941, 61, 585
*Amer. J. dig. Dis.*, 1945, 12, 221

SANDOZ

**SANDOZ**
**PRODUCTS LIMITED**

*134, Wigmore Street, London, W.1*

A H

*a truly restful night*

**the tablet that works to a time-table . . .**

**Outer shell**
Pentobarbitone sodium B.P. 90mg.
Action rapid; duration 3 hours

*with*

**Enteric coated inner core**
Butobarbitone B.P.C. 60mg.
Action begins after 2½ hours; Duration 5 hours.

Bidormal is an effective hypnotic with a two-phase action. It contains a rapid short-acting barbiturate, together with an intermediate-acting barbiturate that has a carefully timed delayed action. Bidormal thus provides a unique and effective means of maintaining calm uninterrupted sleep throughout a complete night of 8 hours. Its lack of residual hangover, drowsiness or "drugged" feeling enables the patient to set about his daily tasks next morning with no diminution of mental acuity and no feeling of drug dependence.

*another new A & H product*

# BIDORMAL

Supplied in bottles of 25 and 500 tablets.

ALLEN & HANBURYS LTD · LONDON · E·2
TELEPHONE: BISHOPSGATE 3201 (20 LINES). TELEGRAMS: "GREENBURYS, BETH, LONDON"

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# THE USE OF HORMONES IN THE MANAGEMENT OF PREGNANCY IN DIABETICS

REPORT TO THE MEDICAL RESEARCH COUNCIL BY THEIR CONFERENCE ON DIABETES AND PREGNANCY *

SINCE the introduction of the use of insulin in diabetes mellitus, the mortality-rate among the offspring of diabetic mothers has declined, but not as markedly as had been expected. With better control of diabetic complications, the rate among viable fœtuses is now less than 25% in many clinics (Tolstoi et al. 1953). In a recent report, however, Nelson, Gillespie, and White (1953) claim that, by the use of the sex hormones stilbœstrol and progesterone ('Proluton'), they have achieved a survival-rate among viable fœtuses of 90%. The rationale of this addition to the usual details of the management of pregnancy in diabetics is based on the work of Smith and Smith (1935), who claimed that in toxæmia of pregnancy a state of hormonal disequilibrium exists. An abnormally low level of œstrogen in the blood at the fifth month of pregnancy and a subnormal increase in pregnandiol excretion during the succeeding months was noted in many toxæmic patients. This pattern was associated, later in pregnancy, with unduly high levels of chorionic gonadotrophin in the serum. Since much of this early work was done on diabetics among whom the incidence of toxæmia was believed to be excessive, White and Hunt (1943) suggested that the abnormal hormone pattern could be rectified by the regular administration of stilbœstrol and progesterone in the hope that toxæmia could be minimised and fœtal death prevented. Their earlier experience indicated that the fœtal mortality-rate for diabetic patients with an abnormal hormonal balance was 40%. In a later series of patients whose abnormality was corrected by appropriate hormone administration, the fœtal mortality-rate fell to 8% (*Ibid*). In their recent paper, Nelson et al. conclude that in diabetics "female sex hormone therapy has reduced the incidence of spontaneous abortion, decreased the number of premature labours, and greatly reduced the occurrence of toxæmia of pregnancy and severe hydramnios."

In view of these results, the Medical Research Council appointed a committee to conduct a controlled clinical trial designed to assess the effect, if any, of treatment by the oral administration of stilbœstrol and ethisterone upon the fœtal survival-rate in pregnancy among diabetics. Although in her earlier work she had used oral preparations, White's (1949) opinion is that stilbœstrol and progesterone should be given intramuscularly and that is now her practice. For widespread routine use, however, repeated injections are irksome, and the present trial was not designed to duplicate precisely her procedures, but to assess the results of a dosage schedule, based on oral preparations of ethisterone, which in combination with stilbœstrol might be expected to have physiological effects similar in nature and intensity to those of the parenteral dosage of stilbœstrol and progesterone used by White.

Although in a controlled trial it is not essential to ensure comparability with the results of other workers, such comparisons will inevitably be made, and the clinical criteria for accepting a patient for inclusion in the trial are given below. White claims that the outcome of pregnancy in the diabetic is affected by three major factors—the age of the mother at the onset of diabetes, the duration of the disease, and the extent of any vascular-renal complications. The control of the diabetes itself is generally thought to be important, although more difficult to assess.

In the present trial the following criteria were used:

1. Patients were not more than 40 years of age at the date of the last menstrual period.

2. The pregnancies were not more advanced than 16 weeks when cases presented for inclusion in the trial.

3. Diabetes was considered to be present (*a*) when there was a well-authenticated past history; (*b*) when, in the presence of diabetic symptoms, a single fasting blood-sugar of 180 mg. per 100 ml. or over was observed; or (*c*) when in the absence of symptoms, and in their presence if the fasting blood-sugar level was below 180 mg. per 100 ml., a sugar-tolerance curve after 50 g. of glucose by mouth, done in the fasting state in the morning after ten days on a full diet, showed a level above 140 mg. per 100 ml. at the start and did not fall below the starting level plus 20 mg. at $2^1/_2$ hours.

Patients were not accepted, although otherwise suitable, in the presence of:

(*a*) Gross retinal changes.

(*b*) Persistent elevation of the diastolic blood-pressure to 90 mm. Hg or above. (The finding of albuminuria was not in itself a reason for rejection.)

(*c*) Other general diseases, apart from such acute conditions as pyelitis, which on their own account would necessitate special management of the pregnancy.

### Design of Clinical Trial

Owing to the relative infrequency of the simultaneous occurrence of pregnancy and diabetes in the population, no one hospital or clinic in this country is likely to accumulate enough patients for a soundly based assessment to be made within a reasonable short time. Accordingly nine centres were asked to coöperate in a centrally planned and controlled investigation. On the assumption that within any one centre the standards and details of obstetric, medical, and pædiatric care would be equal for each group, patients were allocated at random to "hormone-treated" (H) and "non-hormone-treated" (NH) groups. Since prognosis for fœtal survival is in general affected by maternal age and parity, the patients' records were first stratified, centre by centre, into age and parity groups. Within each age-parity group, patients were allocated at random to hormone and non-hormone series. Because of the small numbers involved in any one group, equality between the two series was ensured by allocating the first of the patients to be presented at random to one or other form of treatment, the second to the opposite form and so in pairs. The resultant distribution of cases in any one centre might thus have appeared:

*Centre A*

| *Primiparæ* | | | *Multiparæ* | | |
|---|---|---|---|---|---|
| 20 | 20–24 | 25–29, &c. | 20 | 20–24 | 25–29, &c. |
| H NH | NH H | | NH H | H NH | |
| H NH | H NH | | H NH | NH H | |
| NH H | &c. | | H NH | &c. | |

When accepted and allocated, patients were given a series number which was attached to the clinical record-sheet and to every bottle of tablets required by each patient throughout her pregnancy. Neither patient nor

* Members of Conference: Sir Harold Himsworth, F.R.C.P., F.R.S. (chairman), Mr. H. H. Fouracre Barns, F.R.C.S., F.R.C.O.G., Dr. J. C. Eaton, Dr. Russell Fraser, Prof. W. F. Gaisford, F.R.C.P., Prof. C H. Gray, M.D., Dr. F. Avery Jones, Dr. R. D. Lawrence, Dr. O. Lindan, Prof. N. F. Maclagan, F.R.C.P., Dr. J. M. Malins, Mr. G. D. Matthew, F.R.C.O.G., Dr. M. E. Morgans, Prof. W. I. C. Morris, F.R.C.O.G., Dr. W. G. Oakley, Prof. T. H. Oliver, F.R.C.P., Mr. J. H. Peel, F.R.C.O.G., Dr. D. D. Reid, Dr. G. O. Richardson, Dr. C. F. Rolland, Mr. Linton Snaith, F.R.C.O.G., Mr. C. P. Stewart, D.SC., Dr. G. I. M. Swyer, Prof. R. E. Tunbridge, F.R.C.P.

This report was prepared by Dr. D. D. Reid, and the conference is glad to acknowledge his services in arranging the trial. The conference is greatly indebted to Miss L. M. Colwell for assistance in the analysis of the data.

TABLE I—MATCHING OF HORMONE AND NON-HORMONE TREATED GROUPS

| Characteristic | Hormone group | Non-hormone group |
|---|---|---|
| No. of patients | 76 | 71 |
| Mean age (years) | 22·4 | 20·4 |
| Proportion of primiparæ (%) | 32·9 | 43·7 |
| Fœtal loss rate (all causes) % in previous pregnancies of multiparæ | 52·0 | 53·4 |
| Mean duration of diabetes mellitus (years) | 8·0 | 8·5 |
| Mean stage in pregnancy at acceptance for trial (weeks) | 12·5 | 12·5 |
| Mean number of weeks in hospital before delivery | 2·0 | 2·6 |

clinician knew the type of preparation given, and the tablets, active and inert, were identical in size, appearance, taste, and packing. On the other hand, participating clinicians explained to their patients the nature and intention of the trial and the need for regular reporting and consistent treatment.

### Management of Patients

Specific hormone therapy, commenced before the end of the 16th week of pregnancy, was given orally according to the following daily dosage schedule:

| *Stage of pregnancy* | *Stilbœstrol (mg. per day)* | *Ethisterone (mg. per day)* |
|---|---|---|
| Up to end of 19th week | 50 | 25 |
| 20th–23rd weeks inclusive | 100 | 50 |
| 24th–27th weeks inclusive | 100 | 75 |
| 28th–31st weeks inclusive | 150 | 125 |
| 32nd week until delivery | 200 | 250 |

These doses were dispensed in differently coloured tablets of suitable size.

No strict regimentation of the details of management in several centres is practicable. Some general rules were, however, laid down to ensure reasonable equality of method between the coöperating centres:

1. In the event of obstetrical complications, termination of pregnancy should be carried out when judged desirable by the obstetrician.

2. Otherwise, when the baby was of adequate size and there were no such complications, termination should be at the 36th week by the method most desirable on obstetric grounds.

TABLE II—OUTCOME OF PREGNANCY ACCORDING TO TREATMENT

| — | Hormone treated | | Non-hormone-treated | |
|---|---|---|---|---|
| | No. | % | No. | % |
| Living children | 53 | 69·7 | 49* | 68·1 |
| Stillbirths | 9 | 11·8 | 7 | 9·7 |
| Neonatal deaths | 8 | 10·5 | 10* | 13·9 |
| Abortions | 6 | 8·0 | 6 | 8·3 |
| Total | 76 | 100·0 | 72 | 100·0 |

* Including 1 of a set of twins.

3. If the baby were smaller or larger than usual, the date of termination might be varied up to a fortnight on either side of the 36th week.

4. Pædiatric emergencies were to be treated entirely at the discretion of the clinician-in-charge, but routine care was to be based on the assumption that the babies were premature and they were to be kept in oxygen tents for at least forty-eight hours after birth.

All the children born alive were followed up for at least six months except when death occurred before that age. There was 1 death in the non-hormone-treated group at two months and 1 in the hormone-treated group at seven months, but practically all fœtal deaths occurred within a month after delivery. For that reason we have adopted the usual convention used in discussion of this subject and state our results in terms of abortions, stillbirths, and neonatal deaths alone.

Fœtal deaths before the 28th week of amenorrhœa were classified as abortions. The term "stillbirth" followed legal usage—i.e., an issue after the 28th week of amenorrhœa "which did not after being expelled from its mother breathe or show any other signs of life." An issue dying after showing clear signs of life was classified as a neonatal death. Any fœtus showing viability by surviving longer than twelve hours was, irrespective of the duration of pregnancy, considered to have been born alive; later death put the outcome into the "neonatal death" group. Children surviving for at least one month after birth were described for the purposes of this study as "living children."

In all, 161 patients were referred for inclusion in the trial. Of these, 5 aborted before commencing treatment, 2 had already gone beyond the 16th week of pregnancy before treatment could be begun, in 3 the diagnosis of pregnancy proved to be in error, and in 4 lack of coöperation in treatment or some other complication supervened. Of these 14 patients, 4 had been allocated to the hormone-treated group and 10 to the other. Thus 147 patients were left for the study.

### Special Investigations

In three of the hospital centres assays of urinary pregnandiol were made on all patients at roughly fortnightly intervals by the method of Sommerville, Marrian, and Keller (1948). At two of these centres, assays were made of urinary chorionic gonadotrophin using the prostatic-weight method of Loraine (1950); in the third, the blood-levels of chorionic gonadotrophin were assayed. 79 patients had X-ray photographs taken of the leg and pelvis at some time after the 16th week of pregnancy. Post-mortem reports and material were collected but no detailed discussion of these findings or of the other special investigations is made in this report.

TABLE III—OUTCOME OF PREGNANCY ACCORDING TO PARITY AND TREATMENT

| — | Primiparæ | | | | Multiparæ | | | |
|---|---|---|---|---|---|---|---|---|
| | Hormone-treated | | Non-hormone-treated | | Hormone-treated | | Non-hormone-treated | |
| | No. | % | No. | % | No. | % | No. | % |
| Living children | 17 | 68·0 | 21* | 65·6 | 36 | 70·6 | 28 | 70·0 |
| Stillbirths | 3 | 12·0 | 4 | 12·5 | 6 | 11·8 | 3 | 7·5 |
| Neonatal deaths | 3 | 12·0 | 6* | 18·8 | 5 | 9·8 | 4 | 10·0 |
| Abortions | 2 | 8·0 | 1 | 3·1 | 4 | 7·8 | 5 | 12·5 |
| Total | 25 | 100·0 | 32 | 100·0 | 51 | 100·0 | 40 | 100·0 |

* Including 1 of a set of twins.

### Summary of Results

Although the system of stratification by age and parity and random allocation to hormone-treated and control groups within each hospital should produce reasonably equivalent groups, we have verified this by comparing, as in table I, the mean values in each group with respect to characteristics of past experience and present condition which may be relevant to fœtal survival. The discarding of some patients, as mentioned

TABLE IV—OUTCOME OF PREGNANCY
(Abortions excluded)

| — | Hormone-treated | | Non-hormone-treated | |
|---|---|---|---|---|
| | No. | % | No. | % |
| Living children | 53 | 75·7 | 49* | 74·2 |
| Stillbirths | 9 | 12·9 | 7 | 10·6 |
| Neonatal deaths | 8 | 11·4 | 10* | 15·2 |
| Total | 70 | 100·0 | 66 | 100·0 |

* Including 1 of a set of twins.

TABLE V—DURATION OF PREGNANCY IN WEEKS AT TIME OF DELIVERY

| — | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Hormone-treated:* | | | | | | | | | | | | | | | | |
| Living | – | – | – | – | – | 1 | 4 | 4 | 14 | 16 | 6 | 5 | – | 3 | – | 53 } 70 |
| Dead | 1 | 1 | – | – | 1 | 1 | 1 | 1 | 5 | 1 | 1 | 1 | 2 | 1 | – | 17 } |
| *Non-hormone-treated:* | | | | | | | | | | | | | | | | |
| Living | – | – | – | – | – | – | – | 4 | 14 | 15 | 9 | 3 | 1 | 1 | 1 | 48 } 64* |
| Dead | – | – | – | – | – | 1 | 1 | 1 | 6 | 6 | 1 | – | – | – | – | 16 } |

* Mother of twins *not* included.
Week 37—non-hormone treated—1 living, 1 dead.

above, resulted in a smaller proportion of primiparæ in the hormone-treated groups, but otherwise the trial design has provided adequately matched groups of 76 hormone-treated patients and 71 patients otherwise treated in the same way but not given hormones.

The outcome of the 147 pregnancies is given in table II. Of the "non-hormone" primigravidæ, 1 produced twins, one of whom died after birth, so that survival and loss rates are calculated on 76 and 72 fœtuses. Clearly, the proportion of conceptions producing children surviving one month after delivery is, at about 69%, almost identical in the two groups. Similarly, the differences in abortion, stillbirth, and neonatal fatality-rates are, in view of the small numbers involved, quite insignificantly different. Nor, as shown in table III, does there appear to be any important difference between hormone-treated and non-hormone-treated groups when they are divided according to parity.

The observed frequency of abortion in different series must depend in part on the duration of observation during early pregnancy. If such abortions are excluded and only potentially viable fœtuses already at 27 weeks are followed up, the results obtained are those given in table IV. Again, the difference between the groups is negligible.

Table V shows the duration of pregnancy in weeks at the time of delivery in the two groups. Although 3 of the patients in the hormone-treated group were delivered before the 32nd week of pregnancy, compared with none among the others, the mean dates of delivery (36·0 and 36·4 weeks respectively) were substantially the same in

TABLE VI—DISTRIBUTION OF BIRTH-WEIGHTS IN POUNDS

(Live and still births)

| — | 1– | 2– | 3– | 4– | 5– | 6– | 7– | 8– | 9– | 10– | 11– | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hormone-treated | – | 1 | – | 2 | 9 | 18 | 20 | 9 | 6 | 3 | 1 | 69* |
| Non-hormone-treated | – | 1 | – | 5 | 7 | 17 | 16 | 17 | 2 | 1 | – | 66 |
| Total .. | – | 2 | – | 7 | 16 | 35 | 36 | 26 | 8 | 4 | 1 | 135 |

* 1 stillborn fœtus not weighed.

the two groups. Premature birth was not, therefore, less common among the hormone-treated patients.

*Fœtal Condition*

Table VI shows the distribution of weight at birth in the two groups. The mean weights of all the children weighed in the hormone-treated group is 7 lb. 4 oz. and in the other group 7 lb. 1 oz.—an insignificant difference which does not suggest that hormone therapy reduces the excessive weight of the fœtus in pregnancy among diabetics. (According to data published by Karn et al. (1951) the mean weight of infants born in the 36th week of pregnancy is 6 lb. 10 oz.) Again, this equality implies that immaturity was not more common in the non-hormone-treated group.

There were 4 congenital abnormalities (5·3%) in the hormone-treated group and 7 (9·7%) among the others (a difference within chance limits, $\chi^2 = 0{\cdot}54$, $P = 0{\cdot}50$); and the defect was associated with fœtal loss, although not necessarily its cause, in 3 cases in each group. There was no consistent difference in the pattern of causes of stillbirth or neonatal death in the two groups. Neonatal loss was most often due to pulmonary atelectasis and intracranial hæmorrhage.

*Maternal Health*

The quality of diabetic control during pregnancy was summarised by the attending physicians as "good," "moderate," or "poor," and the distribution of patients into each of these categories in the two groups is shown in table VII. Again, there is little difference between the groups. Incidentally the fœtal survival-rates were almost identical in the three groups.

Table VIII gives the frequency of the various complications among those patients who went beyond the 27th week. Hydramnios is equally common in both series. Patients were classified as toxæmic by the attending obstetricians usually on the basis of the presence of two or more of the classical signs of the condition—œdema, albuminuria, and hypertension. The apparent excess of toxæmia, which was usually mild in severity in the

TABLE VII—DIABETIC CONTROL DURING PREGNANCY

| — | Hormone-treated | | | Non-hormone-treated | | |
|---|---|---|---|---|---|---|
| | No. | % | Fœtal loss rate % | No. | % | Fœtal loss rate % |
| Good .. | 48 | 68 | 25 | 45 | 69 | 24 |
| Moderate .. | 18 | 26 | 22 | 19 | 29 | 25 |
| Poor .. | 4 | 6 | 25 | 1 | 2 | 100 |
| Total .. | 70 | 100 | .. | 65 | 100 | .. |

non-hormone-treated group, was within chance limits ($\chi^2 = 1{\cdot}7$, $0{\cdot}2 > P > 0{\cdot}1$). Moreover, irrespective of whether the diagnosis of toxæmia was actually made, the proportion of patients in whom albuminuria was reported was almost equal in the two series; the same is true of the reporting of œdema. There was no divergence in the trends in blood-pressure during pregnancy between the 56 patients in each group for whom complete readings were available.

There were 2 maternal deaths during the trial: a non-hormone-treated patient died from ventricular fibrillation five days after delivery by cæsarean section, and a hormone-treated patient died twelve weeks after cæsarean section, after a completely normal convalescence.

## Discussion

In the present controlled investigation, a clinically homogeneous group of patients distributed over a number of centres was divided at random into two groups equivalent in all material respects. They were then treated identically except that one group were given oral stilbœstrol and ethisterone in increasing doses while the others were given similar but inert tablets. Such tests of the adequacy of the trial design as have been applied suggest that a balanced allocation had accounted for the major sources of variation and that the results can be accepted with reasonable confidence.

The outcome in each pregnancy was classified according to the definitions given above, into abortions, stillbirths, neonatal deaths, and live births surviving at least one

TABLE VIII—DISTRIBUTION OF COMPLICATIONS OF PREGNANCY

| — | Hormone-treated (70) | | Non-hormone-treated (65) | |
|---|---|---|---|---|
| | No. | % | No. | % |
| Œdema .. .. | 41 | 59 | 40 | 61 |
| Albuminuria .. | 16 | 23 | 13 | 20 |
| Toxæmia .. | 10 | 14 | 16 | 25 |
| Hydramnios .. | 28 | 40 | 26 | 40 |

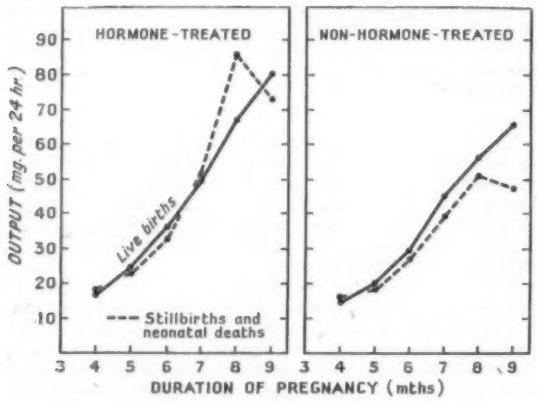


Fig. 1—Urinary output of pregnandiol-like substance.

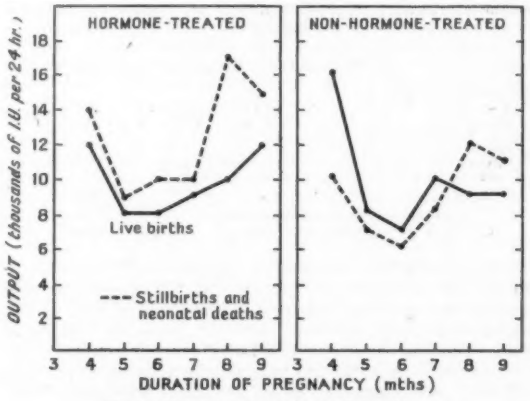


Fig. 2—Urinary output of gonadotrophin.

month after delivery. The main criteria used were the fœtal survival-rate and the incidence of complications of pregnancy among the mothers.

The results obtained were disappointing. The proportion of pregnancies ending in live births was practically identical at nearly 70% in each group. When abortions were omitted, the survival-rate among viable fœtuses rises to about 75% in both series. Although this is comparable with the rates achieved, for example, by Tolstoi, Given, and Douglas (1953), who also cite total stillbirth and neonatal death-rates of between 14% and 25% as typical of the results obtainable without hormone therapy, Nelson, Gillespie, and White (1953) claim that a fœtal survival-rate of 90% can be attained by additional hormone administration. As indicators of hormone output, these workers have used assays designed to measure the amount of pregnandiol in the urine. In this trial we have used similar methods; but it should be noted that these methods are not specific and that the results are liable to be affected, particularly towards the end of pregnancy, by contamination with substances other than pregnandiol which give a colour with sulphuric acid. Nevertheless, there was evidence of significant differences during the few weeks before delivery between the output of such pregnandiol-like substances in pregnancies ending in stillbirth or neonatal death and in the successful pregnancies. The mean results obtained at different stages of pregnancy are set out in fig. 1 where it is obvious that the level of pregnandiol-like substances tended to rise after the eighth month in successful pregnancies but fell in those ending in stillbirth or neonatal death. Similarly, the chorionic gonadotrophin levels in unsuccessful pregnancies seen in fig. 2 tended to fall in the last month. This ominous pattern of declining output of the substances assayed by the tests used occurred in unsuccessful pregnancies in both groups. Thus although there was some evidence of a significantly higher output of substances giving colour with sulphuric acid at the 8th month in the hormone-treated group, this disparity was not followed by any difference between the groups in the pattern of later decline in output associated with fœtal loss. We may suggest, therefore, that one or other or both of the oral preparations were absorbed, and that although they had some effect, direct or indirect, on the urinary excretion of substances giving a colour with sulphuric acid, they made no appreciable difference to the fœtal survival-rate nor to the incidence of the complications of pregnancy among the mothers.

## Summary and Conclusions

Fœtal mortality in the pregnancies of diabetic mothers is notoriously high. A controlled clinical trial was therefore made of the value of oral stilbœstrol and ethisterone in the correction of the alleged hormone disequilibrium which has been suggested as a cause of this excessive fœtal wastage. Comparable groups of patients suffering from diabetes, but free from major cardiovascular complications, attending nine hospitals in the United Kingdom were stratified by age and parity and randomly divided into "hormone-treated" and "non-hormone-treated" groups. One group received tablets containing graduated doses of ethisterone and stilbœstrol; the others were given inert but otherwise identical tablets. In all other respects the management of pregnancy was the same. All the patients, 76 hormone-treated and 71 non-hormone-treated, were followed for at least six months after delivery.

The frequency of stillbirth and neonatal death in the two groups proved to be almost the same, with a total death-rate of viable fœtuses of 24% in the hormone-treated group and 26% in the other. Although birth-weights were on the average equal, there were 4 congenital malformations in the treated group and 7 among the controls; the frequency of malformation associated with fœtal loss was, however, the same, being 3 in each group.

Diabetic control during pregnancy was equally good in the two series, and the incidence of hydramnios, œdema, and albuminuria was equal. There was no significant excess in the incidence of toxæmia in the non-hormone-treated group and the trends in blood-pressure readings during pregnancy were identical.

Assays designed to measure the urinary output of pregnandiol and chorionic gonadotrophin were carried out. Although the methods of pregnandiol estimation are not specific, the assay results suggest that either one or the other, or both, of the oral preparations given were absorbed, but that this had no effect on the pattern of hormone excretion associated with fœtal loss.

From these observations it is concluded that oral stilbœstrol and ethisterone, in the doses here prescribed, do not reduce fœtal mortality in diabetic patients, and have little, if any, beneficial effect on maternal health in pregnancy.

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# EFFECTS OF EXPERIMENTAL HYPOTHERMIA ON VITAL ORGANS

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*With illustrations on coloured plate*

FOR well over a hundred years experimentalists have studied the effects of cold upon the body. As long ago as 1797 Dr. James Currie, of Edinburgh, reported that he had succeeded in lowering a patient's temperature to 83°F by immersion in a brine bath at 40°F. In 1832, Larrey described operations on Napoleon's half-frozen soldiers. Norman Lake (1917), from his investigation of the effects of cold on the body, concluded that reduction to a temperature of –6°C brought about "a state of suspended animation in which for considerable periods the tissue could be preserved intact and its potential vitality maintained at the normal standard."

Smith and Temple Fay (1940) were among the first to apply their knowledge of hypothermia to the treatment of patients. From experiments on the growth of embryonal cells they were aware that cold reduces the metabolism of cells in vitro; they therefore cooled cancer patients in an attempt to check the growth and spread of the tumours. Their investigations stimulated a host of clinicians and research-workers to examine the effects of cold on laboratory animals. Pioneers in this field were Dill and Forbes (1941), Fuhrman and Crismon (1947), and Bigelow et al. (1950a and b).

From the wealth of experimental data thus gained certain basic facts emerged. Cooling of the body reduces metabolic activity, as is shown by slowing of the heart, decrease in the respiratory rate, a fall in the arterial blood-pressure, and a consistent reduction in oxygen consumption. With continued cooling the animal gradually approaches a state in which voluntary movement is absent, respirations cease, the peripheral pulse is imperceptible, and the slowly beating heart alone indicates that life is not extinct.

It seemed that a true state of "suspended animation" had been achieved, and it was not long before the possibilities of such a state were recognised. For years cardiologists had been searching for safe ways of shutting off the circulation during heart surgery. To "dry the heart" by temporarily occluding both venæ cavæ is a simple matter, but the organs deprived of oxygen rapidly succumb. So extracorporeal pumps and oxygenators had been devised to simulate heart action; but each had serious drawbacks. With the advent of hypothermia it appeared that the search was at an end: instead of trying to provide the tissues with oxygen by means of an extracorporeal circulation, it should be possible to reduce the oxygen requirements of the cells to a minimum by cooling. It was thought that the cooled tissues, needing little or no oxygen, would not suffer during the period of circulatory arrest occasioned by temporary occlusion of the venæ cavæ. Bigelow et al. (1950a) did in fact succeed in keeping refrigerated dogs alive despite exclusion of the heart from the circulation for fifteen minutes or more—though 32 out of 39 died.

Stimulated by this poor recovery-rate Cookson et al. (1952), elaborated a technique for the safe occlusion of the venæ cavæ, for twelve minutes only, in hypothermic dogs; and cardiac surgeons looked forward to being able to work in a dry heart and unhampered by cumbersome and uncertain artificial pumps.

But despite the theoretical promise of hypothermia, a strong impression is gained from the literature that the whole technique, comprising hypothermia, vena-caval occlusion, and subsequent rewarming, is uncertain and hazardous. As recently as 1954 Ross, reporting on rapid extracorporeal cooling in dogs, stated that several of the animals died during the warming stage, despite various efforts to halt their downhill course. Though accepted opinion is that no gross alterations in tissue structure can be ascribed to the effects of refrigeration, it seems likely that delicate changes in the cell must take place; and, if demonstrable, these might give early warning of serious damage to come.

The present investigation was undertaken to determine whether any histochemical changes during hypothermia could be demonstrated. As being most likely to show such changes, the vital organs studied were the liver, the kidney, and the adrenal glands.

## Materials and Methods

30 dogs of either sex were used, 8 of them acting as controls. All were mongrels, the only requirements in their selection being a weight of about 40 lb. and a general appearance of good health. They were fed about four hours before refrigeration, and the only preparatory treatment given was a dose of atropine gr. $^1/_{100}$.

### *Anæsthesia*

Anæsthesia was induced with veterinary pentobarbitone sodium (strength 60 mg. per ml.) in the routine dosage of 1 ml. per 5 lb. body-weight. A cuffed endotracheal tube was passed immediately and connected to a supply of pure oxygen, complete with rebreathing bag and soda lime absorber. Polyethylene catheters were tied into the femoral artery and passed into the vena cava through the femoral vein to record the mean arterial and venous pressures, and standard electrocardiograms (leads I and III) were taken. All the recordings were made on a four-channel direct-writing Sanborn 'Poly-Viso Recorder'—temperatures being measured with a rectal mercury thermometer.

### *Preliminary Biopsies*

Before the induction of hypothermia biopsy specimens were taken from the edge of the right lobe of the liver, the greatest convexity of the right kidney, and, in some cases, the inferior corner of the right adrenal gland.

Each specimen was divided into two, one half being fixed in 4% formalin for frozen section and the other placed in alcoholic picroformol solution for dehydration and embedding in wax. To avoid the sequelæ of an open peritoneal cavity, the parietal peritoneum and abdominal wall were closed with a continuous suture, thus restoring the animal to as near normal as possible during the ensuing phase of hypothermia.

### *Hypothermia*

Hypothermia was now induced by laying the dog on an ice-bed maintained at 4°C (39°F) and packing it round with ice chips. As soon as the respiratory rate fell below 6 per minute assisted respiration was instituted.

In the early experiments freezing was continued until death supervened, the aim being to discover the type of cell damage. The knowledge gained was used in a search for similar changes in animals cooled only to the point where cardiac surgery is normally undertaken—i.e., when the arterial blood and the venous blood are identical in colour, denoting that the cooled tissues are utilising the minimum of oxygen. This is regarded as the ideal time to arrest the circulation and is usually about 25°C (77°F). At this point in the later experiments further biopsy specimens were taken and treated as before.

### *Histological Methods*

Throughout this study the frozen sections were stained with a mixture of Sudan III and Sudan IV for lipoids, and the tissues fixed in picroformol were dehydrated, embedded in wax, and used in the study of glycogen, cytoplasmic granules, and cell structure. Glycogen was stained by the periodic-acid-Schiff reagent; Mallory's triple stain was used for the adrenal gland, and Mayer's standard hæmatoxylin and eosin for other tissues. All the sections were cut 5 μ thick.

## Results

This preliminary report will be limited to some of the striking and constant changes observed. All but two of

the colour photographs reproduced were taken from the organs of dogs, which had not been cooled beyond the point regarded as the "ideal surgical stage" of hypothermia. The two exceptions are figs. 12 and 14, which were taken from a dog which underwent more cooling. The changes seen in the adrenal gland of this animal were particularly suitable for colour reproduction, but they differed only in degree from the changes seen in the adrenal glands of all the other dogs.

*Liver*

The normal dog liver (fig. 1) has a lobular pattern in which can be distinguished central hepatic-vein radicles and peripheral portal tracts. Frozen sections stained with hæmatoxylin and Sudan show an absence of fat in the liver cells, with only occasional droplets present in Kupffer's cells and those of the bile-duct epithelium. The liver cells are polyhedral, with remarkably distinct cell membranes; the nuclei are round and central and have prominent eccentric nucleoli; and the cytoplasm is pale (fig. 3).

After hypothermia had been maintained for two and a half hours, changes were visible in frozen sections. The whole tissue took on a blush from the Sudan stain, and contained coarse fatty droplets lying away from the portal tracts (fig. 2); the liver cells lost their former definition, and the nuclei stained more faintly with hæmatoxylin, the nuclear detail being lost (fig. 4). The fat lay in great droplets, each larger than the average liver cell, and many of the droplets did not stain completely, as though composed in part of non-sudanophil substance.

The normal dog liver is full of glycogen, which, when stained by the periodic-acid-Schiff reagent, appears as granules ranging from brilliant purple to red and distributed throughout the entire tissue (fig. 5). In these wax-embedded sections the liver cells are present in obvious cords with clear blood sinusoids between. In the normal liver the sinusoids are narrow, being far less than the average liver cell in width.

After about two hours' refrigeration of the animal, sections of the liver stained for glycogen showed very constant changes (fig. 6). The blood sinusoids were widely dilated and congested with red cells, and the liver cells adjacent to these sinusoids had lost their glycogen granules. The impression gained was that the liver cells in these areas had been "washed" free from glycogen by the increased amount of blood in the sinusoids.

*Adrenal Glands*

The normal dog adrenal gland stained with Sudan shows a distinct zonation of fat in the cortex. The outermost zona glomerulosa contains a moderate amount of sudanophil substance, the broad middle zona fasciculata a great deal, and the innermost zona reticularis only a little (fig. 7).

When hypothermia had been maintained for two and a half hours in the anæsthetised dog, the sudanophil substance of the adrenal cortex was greatly increased (fig. 8), the greatest increase of lipoid being in the zona reticularis, whereas the zona glomerulosa, if anything, had less fat than normal.

Wax-embedded sections of the adrenal gland of the normal dog, when stained with Mallory's triple dye, again show a distinct zonation of the cortex (fig. 11). The outer zona glomerulosa is narrow and consists of large pale-staining cells in nests; the middle zona fasciculata is made up of smaller cells, which also possess pale-staining cytoplasm; and the inner zona reticularis comprises slightly larger cells characterised by mauve-staining cytoplasm. High-power microscopy of these cells shows that the cytoplasm consists of mauve-staining granules so numerous that they give the impression of a "smoky" homogeneous background (fig. 13).

After prolonged hypothermia the adrenal cortex lost its zonation when stained with Mallory (fig. 12). The zona glomerulosa was still evident, but the zona reticularis changed its character completely and no longer showed as a definite mauve-staining band. This was due to the loss of cytoplasmic granules in the cells of the zona reticularis and to the presence of vacuolation in their place (fig. 14). Vacuolation of these adrenal cells was a constant finding after hypothermia of any considerable duration, and its appearance paralleled the large increase of fat in these cells during cooling.

*Kidney*

Frozen sections from the control kidneys, and biopsy specimens from the experimental group, all show the presence of some fat in the tubules (fig. 9). In addition aggregations of round cells are commonly found in all the kidney sections examined. Fat in the kidney cells and round-cell infiltration are not normal findings, but considering that these animals have not been specially bred for experimentation we have accepted the presence of finely divided fat as normal for our average experimental animal. In effect this probably signifies that the majority of our dogs commence with a minor degree of tubular damage before being subjected to any experimental procedure.

After the dog had been cooled to 26°C (79°F), the sudanophil substance in the kidney was much increased (fig. 10). Like the liver, the frozen kidney took on a uniform "blush" with Sudan, and much coarse lipoid had accumulated in almost every distal tubule. Once again the nuclei took up the hæmatoxylin with difficulty. In many instances the cells of the lower nephron were so full of fat that the lumen appeared totally occluded. The glomeruli and upper nephron were remarkably free from lesions.

## Discussion

Despite the wealth of information on physiological responses to cold, very little has been published on the microscopic changes induced. Strangely enough, such references as there are refer to hypothermia applied to man. In 1940, Lawrence Smith reported the effects of cooling more than 100 cancer patients, and Sano and Smith (1940) reported on 50 more cancer patients undergoing either local or general hypothermia. Talbott et al. (1941) published a very full description of a mental patient who died during therapeutic hypothermia; they were largely of the opinion that no serious microscopic damage was caused to the organs during hypothermia in man. Similar views have been expressed on the experimental side. Delorme (1952) says of extracorporeal cooling of dogs that "no histological damage has been found in any tissue following cooling and the functional changes are completely reversible."

In the present hypothermic dogs the chief changes were accumulation of fat in the liver, kidney, and adrenal glands; depletion of glycogen in the liver; and vacuolation of the granular cells of the zona reticularis of the adrenal cortex. The implications of these delicate histochemical changes may well be extensive.

## LEGENDS TO ILLUSTRATIONS ON PLATE

**Fig. 1**—Biopsy specimen of normal dog liver. (Hæmatoxylin and Sudan. ×100.)

**Fig. 2**—Liver of same dog as in fig. 1 after 2½ hours' cooling. (Hæmatoxylin and Sudan. ×100.)

**Fig. 3**—Same liver as in fig. 1 before cooling (×400).

**Fig. 4**—Same liver as in fig. 2 after cooling (×400).

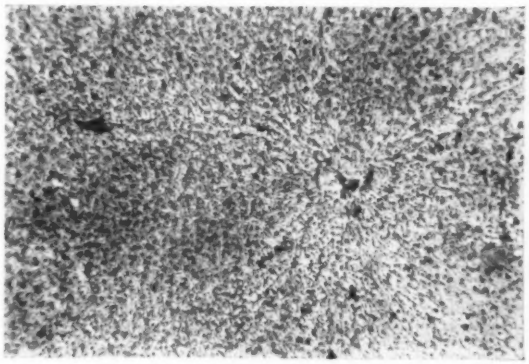
**Fig. 5**—Biopsy specimen of normal dog liver stained to show glycogen. (Periodic-acid-Schiff. ×100.)

**Fig. 6**—Same liver as in fig. 5 after 2½ hours' cooling. (Periodic-acid-Schiff. ×100.)

**Fig. 7**—Normal dog adrenal gland. (Hæmatoxylin and Sudan. ×40.)

**Fig. 8**—Adrenal of dog after 2½ hours' cooling. (Hæmatoxylin and Sudan. ×40.)

DR. KNOCKER: EFFECTS OF EXPERIMENTAL HYPOTHERMIA ON VITAL ORGANS



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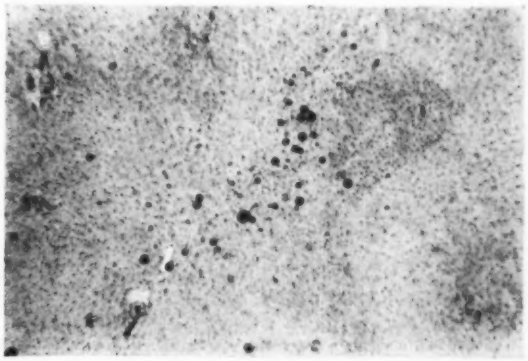

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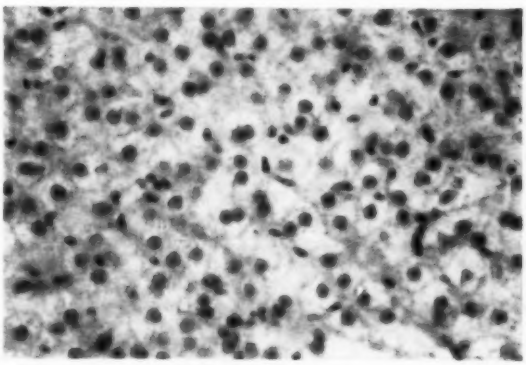

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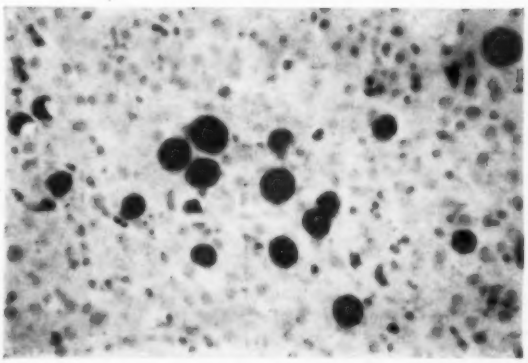

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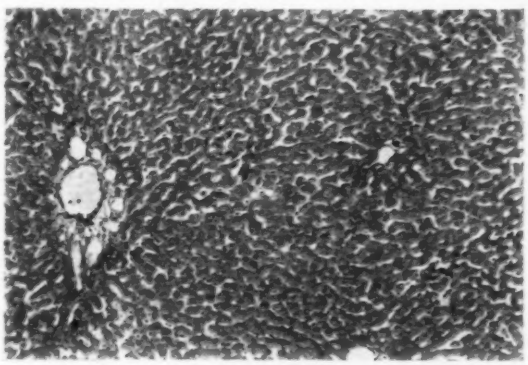

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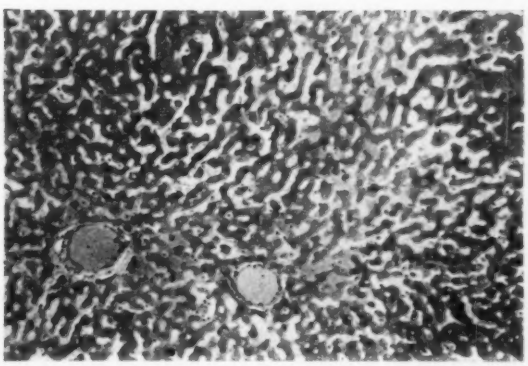

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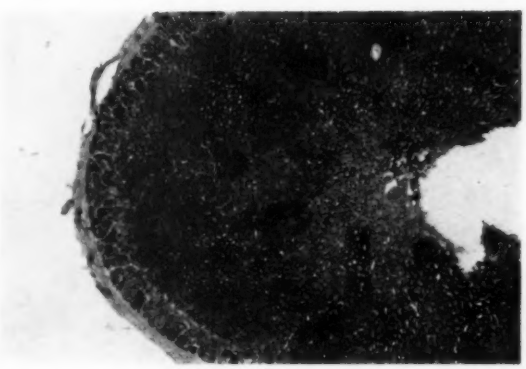

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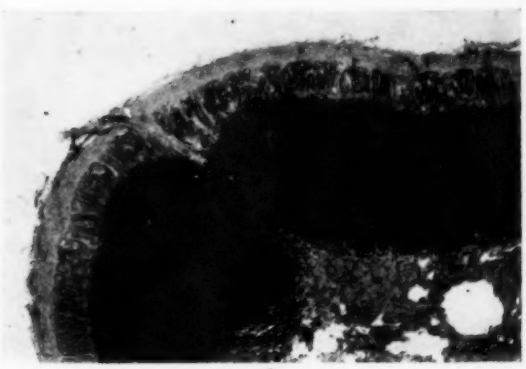

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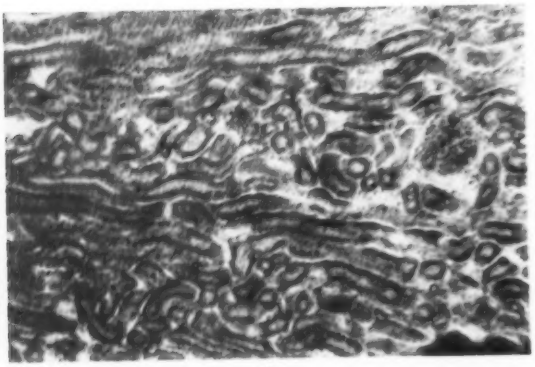

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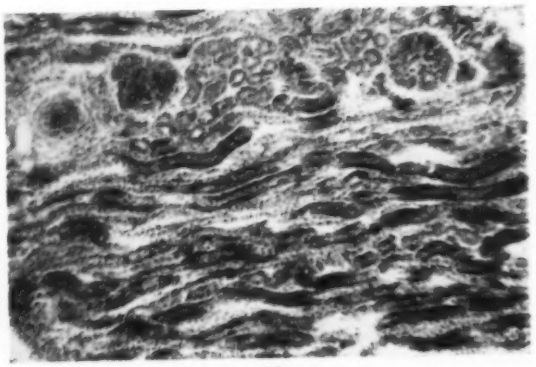

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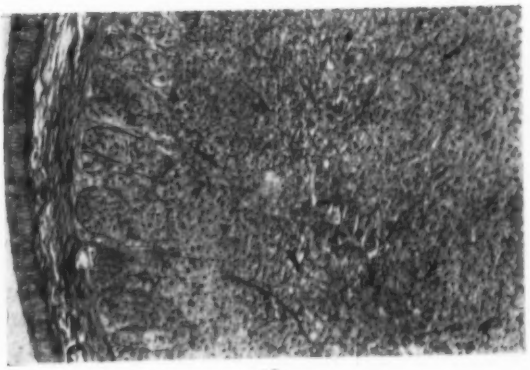

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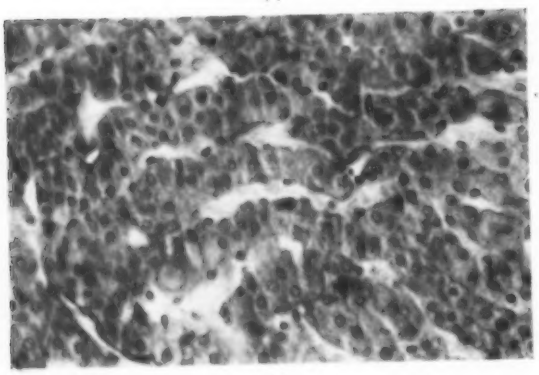

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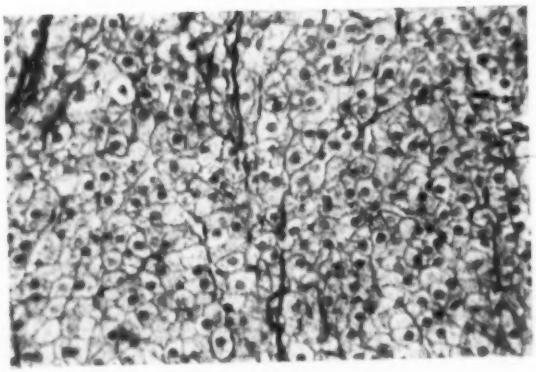

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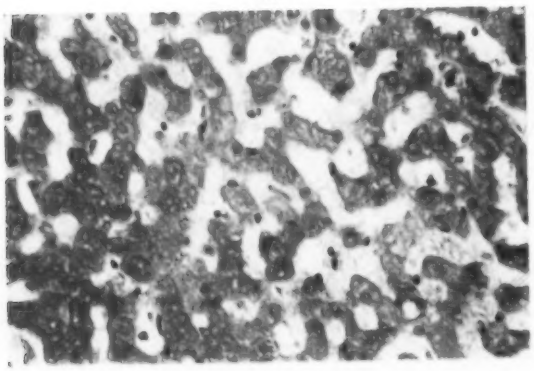

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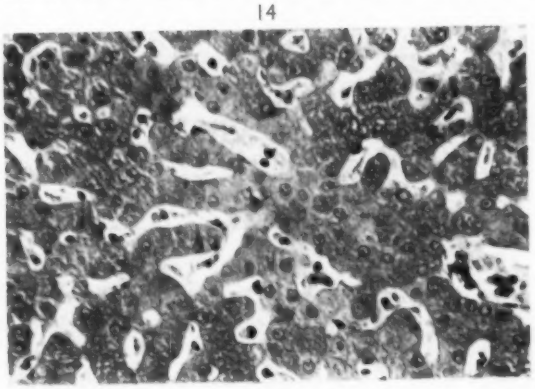

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*Changes in Liver*

Accumulation of fat in the liver is always serious, and is found in the livers of chronic alcoholics and of animals poisoned with carbon tetrachloride, chloroform, and a host of other liver toxins. It is a common finding in cirrhosis and is present in congestive cardiac failure, presumably as a result of cell anoxia. Accumulation of fat to the extent shown in fig. 2 was not found in the liver of any of the control group, even after anæsthesia, maintained for four hours with pentobarbitone sodium and gas and oxygen, and must be accepted as a sign of damage to the hepatic cells.

During the course of hypothermia the liver also consistently loses glycogen. As glycogen protects the liver cell—a fact well known to the biliary-tract surgeon—the cells thus depleted of glycogen are liable to injury. During hypothermia the liver glycogen is lost in the region of the central vein, the same area in which the fat accumulates. It seems very likely that the liver, having lost its glycogen, is falling prey to some toxic process during the cooling, and it is of interest in this connection that Cookson et al. (1952), describing their safe technique for hypothermia and caval occlusion, specifically mention the use of 50% glucose intravenously. In using the glucose they are undoubtedly sparing the liver glycogen and indirectly saving the liver cell from injury.

In considering the mechanism of damage to liver cells during hypothermia it is difficult to suggest anoxia as a causal factor in face of the evidence produced by Bigelow et al. (1950a and b), who concluded, after exhaustive study, that prolonged hypothermia did not produce an oxygen deficit in dogs. Anoxia, however, can and does cause fat to accumulate in the liver cells—hence the classical nutmeg liver of congestive cardiac failure. More convincing still is the fact that, whereas hypothermia produces a rapid and considerable depletion of liver glycogen accompanied by a well-marked rise in the blood-sugar level (Fuhrman and Crismon 1947), experimentally induced anoxia also results in a considerable rise in the blood-sugar level of dogs (Stickney et al. 1948).

Finally, in the present investigation several dogs were anæsthetised for from two and a half to three hours to make them comparable with the refrigerated ones, and anoxia was then induced by the inhalation of nitrous oxide. Sections of their livers stained for glycogen (fig. 16) revealed a loss of this substance in the cells abutting on the central vein—a picture almost identical with that obtaining in hypothermia (fig. 15).

This may not necessarily indicate that hypothermia exerts its harmful effects through anoxia, but it is of interest that the two states are attended by similar results. Possibly, although oxygen may be readily available to the liver cells, hypothermia in some way upsets delicate enzyme systems, preventing the cells from utilising the oxygen despite its ready availability. If this were true it would mean that the high venous oxygen content, characteristic of successful hypothermia, is due to an inability of the cells to utilise the oxygen rather than to their not requiring it. This would upset our whole concept of the effect of cold on cell metabolism; for, instead of reducing the oxygen requirements by cold, we should merely be paralysing some system which normally makes oxygen available to the cell. In our efforts then to prepare the organs for the insult of anoxia we should be using a technique which itself causes anoxia.

*Changes in Adrenal Cortex*

The adrenal changes found in the present investigation are in direct contrast to those described by other workers as the effect of cold on the adrenal glands.

Bacchus (1951) described a depletion of cholesterol from the cells of both the zona fasciculata and the zona reticularis after an hour's exposure of rats to low temperatures. Robinson and Yoffey (1950) claimed that depletion of cholesterol in these two zones can be demonstrated after five minutes' exposure of adult male rats to cold. Bacchus (1951) and Robinson and Yoffey (1950) used rats which were not anæsthetised.

In the present investigation the adrenal glands constantly showed increased amounts of cortical fat after refrigeration.

Depletion of cortical fat is an accepted sign of the "alarm reaction" to stress (Selye 1946). Cold is undoubtedly a stress factor, and in the unanæsthetised animal appears to evoke the expected response. It is conceivable that anæsthesia, particularly with control of shivering, alters the animal's response. This is one explanation of the increase of fat repeatedly found in the adrenal cortices of the dogs in this experiment.

Selye (1946) describes an increase of cortical fat as indicating the "resistance phase" of the adaptation syndrome. The question arises whether the increased fat present in these adrenal glands represents this "resistance phase" or, in common with the changes in the liver and the kidney, constitutes further evidence of a generalised fatty metamorphosis.

The vacuolation of cortical cells (fig. 14) visible in the wax-embedded preparations paralleled the increased fat very closely. When animals are cooled to extinction, the vacuolation is at its height and the normal granularity of the inner-zone cells is lost. Lawrence Smith (1940) observed coarse vacuolation of the cytoplasm of cortical and medullary cells in the adrenal glands of patients who had died after attempted therapeutic hypothermia.

Vacuolation was a constant finding in the present experiments. The more prolonged and damaging the cooling the more vacuolation was evident, until at death it was very considerable. It seems more than likely that the increased fat in frozen sections and the vacuolation in the dehydrated sections are one and the same process. Whatever its causation it appears as a serious omen, increasing more and more as death approaches.

*Changes in Kidney*

During hypothermia, fat accumulates in the lower nephron. This may be due to the direct effect of cold on the tubules or to the indirect effect of cold on the kidney, such as shunting of the circulating blood, excluding the lower nephron. During the progress of hypothermia urinary secretion gradually diminishes (Ross 1954), until at about 25°C (77°F) there is little or none.

Nedzel (1952), who measured the urinary flow of cooled dogs, states that the normal kidney secretes little or no urine during cold immersion of the animal; and that the output of urine is diminished invariably in renal ischæmia. He has shown that renal cortical ischæmia occurs during refrigeration, and it seems possible that this reduced cortical blood-flow may result from a shunting of the renal circulation as observed by Trueta (Trueta et al.1947), in his investigations on the effects of limb trauma on the renal circulation. It seems possible that a similar shunting of the renal circulation takes place during hypothermia,

## LEGENDS TO ILLUSTRATIONS ON PLATE

**Fig. 9**—Biopsy specimen of normal dog kidney. (Hæmatoxylin and Sudan. ×100.)

**Fig. 10**—Same kidney as in fig. 9 after 2¾ hours' cooling. (Hæmatoxylin and Sudan. ×100.)

**Fig. 11**—Normal dog adrenal gland. (Mallory's triple dye. ×100.)

**Fig. 12**—Adrenal gland of dog that died after 3½ hours' refrigeration. (Mallory's triple dye. ×100.)

**Fig. 13**—Cells of zona glomerulosa of adrenal gland shown in fig. 11 (×400).

**Fig. 14**—Cells of zona glomerulosa of adrenal shown in fig. 12 (×400).

**Fig. 15**—Liver of dog cooled to 25°C. (Periodic-acid-Schiff. ×400.)

**Fig. 16**—Liver of anoxic dog. (Periodic-acid-Schiff. ×400.)

possibly in compensation for the fall in arterial pressure. Such a diversion of the cortical blood-flow would render the cells of the kidney tubules relatively anoxic and might be responsible for the swelling and fatty accumulations in the cells of the tubules.

It is well known that exposure to cold can produce nephritis in man. "War nephritis" was seen mainly in soldiers who were chilled. In an attempt to elucidate its mechanism Lewis and Thompson (1951) produced cold injury in rabbits by immersing one hind limb for thirty minutes in an alcohol bath at 5–25°C. The rabbits were killed after periods ranging from less than a week to more than a month after injury. These workers reported that the kidneys of all the animals exhibited both gross and microscopic lesions. Macroscopically they found pallor of the cortex and pitting of the kidney surface, whereas microscopically there was tubular epithelial damage involving groups of nephrons. These groups showed hydropic degeneration, fatty metamorphosis, exudation, and even necrosis and casts in individual tubules. The distal convoluted tubules were mainly affected, but there was also damage in the thick loops of Henle and the collecting tubules. Few glomeruli were involved. Being initiated by localised cold trauma only, these changes allow one to predict the likelihood of similar damage if the whole body is cooled.

Without survival experiments one cannot say that these changes are irreversible. However, there is no doubt that they take place during hypothermia, and there is no denying that they represent pathological change.

*Significance of Changes*

It is essential to draw attention to the similarity between the tissue changes induced by hypothermia and those described by Selye (1946) as bodily reactions to stress. Selye has produced adrenal pictures almost identical with fig. 12 by subjecting animals to the stress of repeated doses of formaldehyde by injection, and has published plates showing well-marked fatty infiltration of the liver following the stress of exposure to cold. Of great interest are the pancreatic changes he has produced with the stress of forced muscular exercise in rats.

Although pancreatic tissue was not studied in the present series, references to acute pancreatitis following cooling have been published. Sano and Smith (1940) reported that 10% of their cancer patients treated by hypothermia had signs of acute pancreatitis when they died. As none of the untreated cancer controls showed signs of pancreatitis at death these workers concluded that the cold therapy was responsible for the pancreatic changes. When one recalls that Selye was able to produce disseminated areas of pancreatic necrosis by merely over-exercising his rats, it seems likely that the stress of severe cold could induce similar changes.

There is obvious similarity between Selye's results, induced by exposure of animals to stress, and those discovered during the course of surface cooling in dogs.

One is thus driven to the conclusion that contrary to our scientific expectations, hypothermia is at best an exposure to severe stress. This stress excites certain fairly stereotyped reactions in the tissues. These cellular changes may not all be permanent, but they are undoubtedly pathological and almost certainly account for some of the hitherto unexplained deaths of laboratory animals undergoing cooling or subsequent rewarming.

There is no proof that the changes are due to anoxia, but there is much evidence to show that cellular anoxia can lead to similar change.

The aim of hypothermia has always been to diminish the metabolism of the cells before temporary occlusion of the circulation. After seeing the tissue changes induced by the accepted degree of hypothermia one questions whether the insult imposed upon the tissues by cold is sound preparation for ensuing anoxia. Furthermore, there is evidence of tissue damage during hypothermia combined with temporary suspension of the circulation:

Bigelow and McBirnie (1953) cooled 12 monkeys and subsequently arrested their circulations for one or two hours. 6 of the monkeys developed serious wound sepsis and died or had to be killed on this account.

If hypothermia really induced a true state of suspended animation, such serious tissue damage should not occur even after a period of circulatory arrest. On the contrary, this failure of primary healing is very reminiscent of that observed in patients undergoing operations during the course of cortisone therapy, and may be due to the liberation of large quantities of cortical hormone as a normal reaction to the stress of hypothermia. This is a question for serious consideration.

## Conclusions

When hypothermia is induced in dogs, histopathological changes take place in vital organs. These changes are seen even when the animals are not cooled beyond the point generally regarded as ideal for surgery.

The tissue changes seen in liver, kidneys, and adrenal glands are such as to make it questionable whether hypothermia ought to be used as a means of enabling patients to withstand circulatory arrest during operations on the heart.

The cell changes resulting from hypothermia closely resemble those reported by other workers as resulting from various forms of stress, and are perhaps attributable to tissue anoxia.

If, as seems likely, they may readily become irreversible, this would account for some hitherto unexplained deaths of animals during experimental hypothermia.

I am much indebted to Sir Charles Dodds for his advice; to Prof. W. E. Underwood, in whose department this work was done, for his constant help, criticism, and encouragement; and to Dr. Vernon Wilson, my senior associate in this study, for his coöperation, guidance, and comradeship during the many tedious hours of experimentation. I want also to record my thanks to Dr. Hugh Foord and Dr. Roy Allen for their assistance with problems of anæsthesia; to Dr. F. A. Brandt, of the South African Institute for Medical Research, for his colour photography as well as frequent technical aid; and to Mr. R. L. Caunter, senior technician in the department of surgery, University of Witwatersrand, for valuable help with the physiological aspects of the experiment.

The whole project was made possible only by generous financial support from several business houses in South Africa, to whom we are correspondingly grateful.

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# THE RESPONSE OF THE HEART IN ACUTE NEPHRITIS

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ALTHOUGH acute nephritis is regarded as primarily a renal disease, circulatory disturbances form a conspicuous part of the clinical picture. The systemic hypertension which is generally present, and the acute increase in plasma volume, are both factors which may embarrass the heart, and manifestations of left heart-failure and acute pulmonary œdema are not unknown.

Acute nephritis affects healthy young people and is one of the few conditions in which heart-failure occurs but complete recovery is the rule. This paper reports studies on the circulation in acute nephritis from early in the disease to recovery, using the Valsalva manœuvre as the test procedure. This manœuvre has previously been shown to be a simple and repeatable method of differentiating between the normal and the failing circulation (Sharpey-Schafer 1955).

## Material

Eleven consecutive patients with acute nephritis were investigated. All gave a history of skin or throat infection from 1 to 4 weeks before the onset of symptoms; in five the infection was proved to be streptococcal.

In three of the patients dyspnœa was a presenting symptom, but several others, when specifically questioned, admitted breathlessness on exertion. Initially, in all cases the jugular venous pressure was raised and the hæmoglobin level was decreased; in most of them the blood-pressure was raised (see table). Serial radiographs showed that the heart was enlarged initially in all the patients, and there were increased vascular markings in the lung fields (fig. 1). Serial electrocardiograms were normal in all the patients. Four had no albuminuria, casts, or red cells in the urine when first seen; in two of these, subsequent examination of every specimen of urine throughout the illness showed albumin in one or two specimens, but in the other two cases the urine was normal throughout.

It is well known that about 5% of patients with classical acute nephritis have minimal abnormal urinary findings. Abnormal urinary constituents are, however, a crude index of disturbed renal function, and their absence should not lead to the assumption that the kidneys are healthy. The conspicuous retention of water and salt in such cases shows that renal function is altered.

The rate of recovery was very variable. In many patients diuresis began within a few hours of being put to bed. In a few, however, recovery took place gradually over several weeks.

## Methods

The first observations were made within a few hours of admission to hospital and repeated every few days until recovery was complete.

The Valsalva test was made by blowing a mercury column to 40 mm. Hg for 10 seconds, while the effects on the systemic blood-pressure were recorded continuously with capacitance manometers (Hansen 1949). The effects of the Valsalva manœuvre are as follows:

Owing to the raised intrathoracic pressure, blood accumulates in the periphery, and the central effective venous pressure falls (Lee et al. 1954). In normal subjects, this decreases the stroke output and pulse pressure, with consequent vasoconstriction and rise of diastolic blood-pressure. Persistence of the vasoconstriction after the intrathoracic pressure has been released is largely responsible for the subsequent observed "overshoot." In heart-failure, on the other hand, reduction of the cardiac filling pressure causes either no change in stroke output or (in severe cases) an increase: if the stroke output is unchanged the arterial pressure record has a square-wave pattern, whereas if the stroke output is increased there is an increased pulse pressure with resulting "undershoot" (Sharpey-Schafer 1955).

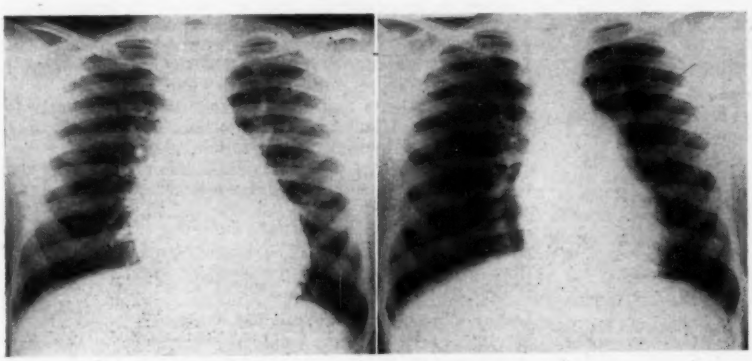
Judson et al. (1955) also found a square-wave pattern in heart-failure. They thought that the high venous pressure in heart-failure prevented the "normal obstruction of venous return" during the Valsalva manœuvre, and that venous return was

ANALYSIS OF CASES

| Case no. | Age (yr.) | Sex | Day of illness since first symptom | Jugular venous pressure (cm. blood above sternal angle) | Arterial pressure (mm. Hg) | Hæmoglobin % | Weight (lb.) | Valsalva manœuvre: % decrease in pulse pressure | Valsalva manœuvre: % increase in diastolic pressure |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 10 | M | 7 | 14 | 184/116 | 76 | 116 | 11 | 5 |
| | | | 25 | N | 136/71 | 94 | 105 | 55 | 54 |
| 2 | 30 | M | 4 | 12 | 105/58 | 90 | 164 | 0 | 4 |
| | | | 14 | 4 | 110/58 | 112 | 146 | 29 | 27 |
| | | | 28 | N | 113/56 | 110 | 148 | 56 | 61 |
| 3 | 40 | M | 6 | 9 | 142/80 | 74 | 150 | 8 | 0 |
| | | | 14 | 1 | 139/63 | 80 | 136 | 43 | 41 |
| | | | 30 | N | 112/44 | 94 | 138 | 62 | 72 |
| 4 | 32 | F | 5 | 11 | 160/79 | 74 | 141 | 9 | 0 |
| | | | 13 | 4 | 171/98 | 88 | 135 | 27 | 15 |
| | | | 33 | N | 142/73 | 94 | 122 | 46 | 43 |
| 5 | 27 | M | 7 | 8 | 154/96 | 78 | 144 | 9 | 0 |
| | | | 9 | 2 | 142/86 | 88 | 137 | 24 | 22 |
| | | | 21 | N | 120/73 | 96 | 129 | 58 | 75 |
| 6 | 28 | F | 11 | 4 | 166/90 | 83 | 161 | 21 | 20 |
| | | | 16 | N | 146/77 | 105 | 151 | 52 | 35 |
| | | | 29 | N | 104/36 | 104 | 152 | 67 | 120 |
| 7 | 27 | M | 4 | 11 | 145/80 | 91 | 147 | 0 | 5 |
| | | | 6 | 5 | 118/67 | 110 | 133 | 23 | 22 |
| | | | 9 | N | 114/68 | 119 | 122 | 39 | 44 |
| 8 | 24 | M | 9 | 1 | 189/116 | 70 | 150 | 17 | 15 |
| | | | 18 | N | 160/71 | 106 | 112 | 57 | 55 |
| 9 | 31 | M | 3 | 14 | 183/100 | 76 | 210 | 0 | 0 |
| | | | 7 | 2 | 190/91 | .. | 207 | 37 | 41 |
| | | | 13 | N | 184/100 | 104 | 180 | 55 | 54 |
| 10 | 10 | M | 4 | 6 | 131/73 | 82 | 84 | 4 | 0 |
| | | | 15 | N | 125/70 | 106 | 76 | 48 | 43 |
| 11 | 29 | M | 7 | 5 | 187/101 | 66 | 161 | 5 | 2 |
| | | | 21 | N | 119/68 | 86 | 149 | 63 | 82 |

N, normal.

The method of calculating the decrease in pulse pressure and the increase in diastolic pressure is explained in the caption to fig. 3.



*a* *b*

**Fig. 1—Case 1: *a*, 7th day of illness; *b*, 19th day.**

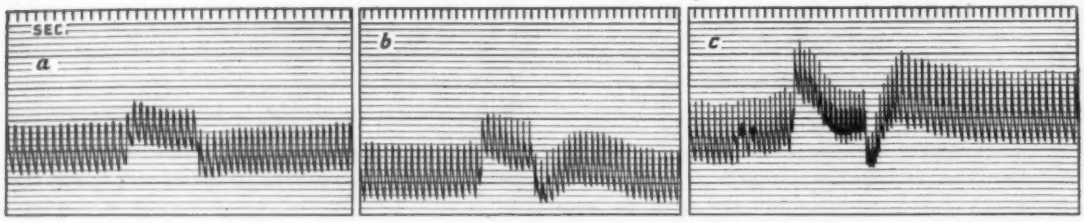



Fig. 2—Arterial pressure in case 5 : *a*, 7th day of illness ; *b*, 9th day ; *c*, 21st day.

maintained in congestive heart-failure. This seems to be an example of the usual confusion between venous return and filling pressure, which can be shown to fall by direct measurement. Judson et al. did not observe that the most severe cases of heart-failure show an increased stroke output and pulse pressure during the Valsalva manœuvre and a subsequent vasodilatation—a finding incompatible with their explanation.

## Results

Results are shown in the accompanying table. Fig. 2 shows examples of the different types of response to the Valsalva manœuvre recorded during the course of the illness.

Patients admitted to hospital early in acute nephritis, with maximum weight-gain, all showed the type of response characteristic of heart-failure ; there was no decrease in pulse pressure and no " overshoot." Cases 6 and 8, when first seen, were already in diuresis with decrease in pulse pressure and a small " overshoot," but serial records afterwards showed that this initial response was abnormal for them. In all the cases the response returned to the normal pattern on recovery.

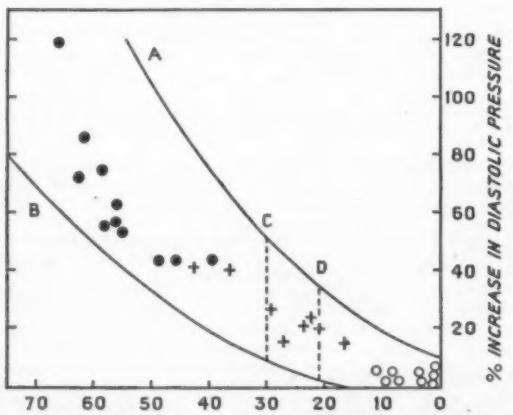



Fig. 3—Summary of results.

Open circles, data obtained up to 8 days from first symptom.
Crosses, data from 9 to 16 days after onset.
Black circles, data after recovery.

Similar data from 62 normal subjects and 63 patients with heart-failure lie between curves A and B, the vertical line C indicating the lower limit of normal and D the upper limit of heart-failure.

$$\text{Percentage decrease of pulse pressure} = \frac{\text{Control pulse pressure} - \text{maximum change in pulse pressure during Valsalva}}{\text{Control pulse pressure}} \times 100$$

$$\text{Percentage increase in diastolic pressure} = \frac{\text{Maximum change in diastolic pressure after Valsalva} - \text{control diastolic pressure}}{\text{Control diastolic pressure}} \times 100$$

The results are summarised in fig. 3, in which the percentage change in pulse pressure during the phase of raised intrathoracic pressure is plotted against the subsequent change in diastolic pressure. These points lie on the curve obtained from similar data from 62 normal subjects and 63 patients with chronic heart-failure (Sharpey-Schafer 1955).

The results are compatible with the view that baroceptor responses to acute changes in pulse pressure give rise to change in peripheral resistance, a decrease in pulse pressure causing vasoconstriction, and an increased pulse pressure vasodilatation (Ead et al. 1952, Sharpey-Schafer 1953, 1955). When the pulse pressure does not change, the diastolic blood-pressure also does not change.

## Discussion

In acute nephritis at the height of the illness, the heart responds to a decrease in filling pressure in the same way as the failing heart. The increase in blood-pressure and in plasma volume would appear the most obvious factors causing failure, but abnormal cardiac responses have been recorded in the apparent absence of both. Possibly some other factor may be present ; electrolyte changes or the streptococcal process may affect the myocardium, although electrocardiographic and histological evidence of myocardial damage is absent.

A rise in jugular venous pressure in acute nephritis was reported by La Due (1944). It was present in the acute stage not only in the eleven cases here summarised but also in all of thirty-five others seen by me in hospital practice, and it is a useful physical sign. Mild cases of nephritis may exist with a normal venous pressure, but they are either undiagnosed or not admitted to hospital. In the differential diagnosis from pericarditis, in cases with little abnormality in the urine, the absence of tachycardia and electrocardiographic changes is a helpful point.

## Summary

The circulation was studied in eleven consecutive cases of acute nephritis, using the effect of the Valsalva manœuvre on arterial blood-pressure as a criterion.

Early in the illness the response was of the square-wave type recorded in all forms of chronic heart-failure. Serial records showed a progressive return to a normal response.

The data are compatible with the theory of baroceptor responses to acute pulse-pressure changes.

All the patients had a raised venous pressure early in the disease, as had thirty-five others seen in hospital. Two had no albuminuria.

Increased arterial pressure and plasma volume may not be the only factors causing heart-failure.

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# CHRONIC BRONCHITIS

## THE EFFECT OF CIGARETTE-SMOKING

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AT least six factors contribute to the development of chronic bronchitis. These are infection, polluted inspired air, the accompaniments of poverty, allergy, heredity, and the degenerative changes of advancing years. In addition, chronic bronchitis may be secondary to various pulmonary and general diseases.

Assessment of the relative importance of any one factor is likely to be hazardous, and can best be undertaken by selecting a group of people as similar as possible in all other respects. In the present instance the factor of cigarette-smoking was investigated, and comparison was made of the prevalence of minor respiratory symptoms and of bronchitis in smokers and non-smokers. Inevitably, the two groups are self-selected, so that any innate quality which may cause some people to smoke and others not to smoke, and the bearing that such a quality might have on the subsequent development of bronchitis, cannot be assessed. Possible differences between men and women and the greater frequency of bronchitis in older people necessitate subdivisions by age and sex.

### Method

In the Civil Service considerable numbers of employees are available for questioning, and groups may be selected of similar age, sex, occupation, exposure to respiratory infections and atmospheric pollution, income, and domestic circumstances. As only a small proportion have bronchitis, a large number need to be interviewed. For this reason a simple card was devised which could be completed by trained full-time welfare workers after the first few hundred cards had been completed by them under the supervision of one of us (V. C. M.). The accuracy with which the forms were completed was checked fortnightly throughout the trial.

Smokers were regarded as those who had smoked five or more cigarettes a day for five or more years; further divisions within the smokers were not made, because this would have meant a great increase in the number of employees interviewed. The rest were regarded as non-smokers. The number who had smoked pipes and not cigarettes was not noted.

Doll and Hill (1950) found that among patients with carcinoma of the bronchus the proportion who had smoked pipes but not cigarettes was 5·7%, while among controls with other diseases it was 9·7%; so perhaps the proportion of "pure" pipe-smoking males in our series was of the order of 7%. As these were regarded, for present purposes, as non-smokers, any effect that pipe-smoking may have on the development of bronchitis will tend to lessen the difference apparent between smokers and non-smokers (as already defined) as regards the prevalence of the disease.

The completed form included the following information: name, age, sex, smoker or non-smoker, former respiratory diseases, and year of last radiograph of the chest. The grading of respiratory symptoms was done by placing each person in one of the following five categories:

(1) *Complete freedom from pulmonary symptoms.* No cough, sputum or breathlessness. No colds going down to the chest.

(2) *Occasional or habitual morning cough or sputum, especially after colds.* No breathlessness. Negligible pulmonary disability.

(3) *Mild bronchitis.* Usually habitual cough and sputum. Maybe some breathlessness, often only during exacerbations. Mild disability. May cause sick absences of a week or two.

(4) *Moderate bronchitis.* As above, but moderate disability; capable of doing moderate work, but often with sick absences of a month or so.

(5) *Severe bronchitis.* As above but severe disability; capable of no more than light or sedentary work.

The emphasis in the grading was on symptoms and disability, and bronchitis was never diagnosed unless there was disability from exacerbations or breathlessness or both. Usually the symptoms referred to the previous five years. No physical examination was made.

The investigation was limited to the London office staffs of the Treasury and the Ministry of Supply, and of these 6245 clerical workers were taken as a suitable group of sufficient size. Of this number, 5844 (93·6%) were interviewed. Of the remainder, 34 (0·6%) refused to coöperate and 367 were either on leave or away on temporary duty (about half) or off sick. A review of the sickness records of a sample of 1400 clerical workers included in the survey showed that about 13% of the time lost through sickness was due to "bronchitis"; hence, the number of bronchitics who were lost to the survey was probably small. The forms were completed during the period from December, 1954, to May, 1955, upon 3602 men and 2242 women. Only employees between the ages of 15 and 65 were included; so no opinion can be given about the effect of smoking on the large and important group of bronchitics over the age of 65.

As regards the accuracy of the diagnosis, the completed forms revealed that 76% of the employees had had radiographs of the chest within the previous five years, and that the only significant "former respiratory diseases" were asthma and tuberculosis, which between them were noted in slightly more than 1% of the employees. A check of the reliability of the diagnosis in the moderate and severe grades of bronchitis is afforded by our experience in the bronchitis clinic at the Brompton Hospital. A clinical and radiological review of 513 Civil Servants who had been repeatedly absent from work with bronchitis, almost all of whom were men over 40, showed that 5% had had pulmonary tuberculosis, 3% had bronchiectasis, usually of minor degree, and 1% had a carcinoma of the bronchus in addition to the bronchitis.

Undoubtedly some of the clerical workers under review had respiratory diseases which were potential causes of bronchitis: the numbers could not be determined by the method of investigation, but Brompton Hospital experience suggests that not more than 10% of them had other important respiratory diseases.

### Results

The accompanying table shows the results of the survey. The three grades of bronchitis have been grouped

PREVALENCE OF MILD RESPIRATORY SYMPTOMS AND BRONCHITIS IN 5844 CLERICAL WORKERS IN THE CIVIL SERVICE IN LONDON (3602 MALES, 2242 FEMALES)

| — | Aged 15–39 | | Aged 40–65 | |
|---|---|---|---|---|
| | Smokers | Non-smokers | Smokers | Non-smokers |
| *Males:* | | | | |
| No respiratory symptoms | 276 (40·6%) | 255 (49·9%) | 674 (34·8%) | 260 (54·9%) |
| Mild symptoms .. .. | 340 (50·0%) | 235 (46·0%) | 906 (46·8%) | 139 (29·3%) |
| Bronchitis .. .. | 64 (9·4%) | 21 (4·1%) | 357 (18·4%) | 75 (15·8%) |
| Total .. .. .. | 680 | 511 | 1937 | 474 |
| *Females:* | | | | |
| No respiratory symptoms | 159 (40·6%) | 352 (54·1%) | 198 (34·3%) | 317 (51·0%) |
| Mild symptoms .. .. | 193 (49·2%) | 258 (39·6%) | 271 (46·9%) | 229 (36·9%) |
| Bronchitis .. .. | 40 (10·2%) | 41 (6·3%) | 109 (18·8%) | 75 (12·1%) |
| Total .. .. .. | 392 | 651 | 578 | 621 |

together so that the figures shall be large enough for statistical analysis. Of the 782 employees regarded as having bronchitis 74% fell into group 3 (mild), 22% into group 4 (moderate), and 4% into group 5 (severe). The distribution of the groups between smokers and non-smokers was similar, the figures for group 3 (mild) being 80% for those under 40 years of age and 72% for those over 40.

The most striking feature in the table is that in every instance the proportion of employees having "mild respiratory symptoms" and "bronchitis" is consistently higher among smokers than among non-smokers. The greater prevalence of bronchitis in the older age-group is clearly shown.

For the entire series, 36% of the smokers were free from respiratory symptoms, compared with 53% of the non-smokers.

About 48% of the smokers and 38% of the non-smokers had "mild respiratory symptoms." This difference must be accounted for to some extent by the so-called smoker's cough.

The prevalence of "bronchitis" was 15·9% in the smokers and 9·4% in the non-smokers, the over-all prevalence being 13·4%.

The prevalence of bronchitis in smokers of the two sexes is very similar; the differences in non-smokers are small. These findings suggest that sex is not an important factor in the development of bronchitis among persons living and working in similar circumstances.

### Discussion

Chronic bronchitis is difficult to define, and even more difficult to classify into grades of severity. Clearly there are many people who have no respiratory symptoms and are devoid of any evidence of bronchitis. Others have an occasional or habitual morning cough or sputum, with no breathlessness and with a negligible pulmonary disability. There is a tendency to regard such persons as bronchitics, especially if colds in the head are accompanied by an increase in sputum; but this is inadvisable in the absence of disability: indeed, in this series, had all the employees with respiratory symptoms been regarded as bronchitics, more than half would have been so diagnosed.

In an investigation such as this, in which physical and radiological examinations were omitted and no physiological function tests were done, the criteria of "disability" are hard to standardise. Cough and sputum are unreliable indices because they often occur in persons without disability, and may be absent in chronic bronchitis (Oswald et al. 1953). Hence, reliance was placed on the two outstanding causes of disability—namely, breathlessness compared with normal people of the same age and sex, and exacerbations of infection of sufficient severity to interfere with the normal mode of life, the degree of disability being then assessed as mild, moderate, or severe. This grading has the merit of simplicity, and it was felt that any more complicated scheme would have been unsuitable for the non-medical workers who completed the questionnaires. In practice there was no difficulty in determining which employees had no respiratory symptoms; but some doubt must exist about the accuracy of allocation of employees into grades 2 and 3—i.e., in determining whether or not a real disability existed. The welfare workers who completed the forms were very carefully supervised throughout the investigation, but the fact remains that 74% of all those regarded as bronchitics fell into grade 3 (mild); presumably this figure would have had to be modified if full clinical and radiological examinations had been done.

Happily there is no reason to suppose that the grading of the employees was in any way influenced by their smoking habits; in fact, when they completed the forms, the welfare workers were unaware that any special importance was being attached to the relation between smoking and bronchitis. Thus the figures may be taken to represent truly the differences in prevalence of bronchitis in the smokers and non-smokers under review.

The consistently higher percentages in smokers both for minor respiratory symptoms and for bronchitis leave little doubt but that smoking is conducive to the development of bronchitis. To what extent it is so cannot be deduced even from this highly selected population; indeed, with so many variable factors to be considered, an accurate answer to this question is unlikely ever to be forthcoming. The survey gives no information about the type of bronchitis in the two groups, but the smaller difference between smokers and non-smokers among the bronchitic males in the older age-group suggests that the effect of smoking wanes with increasing years.

The strikingly similar percentages in males and females, especially for smokers, indicate that sexual differences are not important in the age-group 15–65 when persons of similar living and working conditions are compared. The excess of bronchitis in men in this series can be explained entirely by the fact that smoking is much commoner in men than women.

### Summary

The prevalence of minor respiratory symptoms and bronchitis in 5844 Civil Service clerical workers is compared with their smoking habits.

The proportion of clerical workers having minor respiratory symptoms and bronchitis was consistently higher in smokers than in non-smokers.

The prevalence of bronchitis was similar in males and females. It is suggested that, when men and women live and work in similar circumstances, they are equally likely to develop bronchitis; but, since men smoke more than women, more men than women are likely to have bronchitis.

Our thanks are due to Dr. D. D. Reid for assistance in interpreting the statistical aspects and to Dr. W. E. Chiesman, Treasury Medical Adviser, for his continued interest and support. This investigation was made possible by the kind coöperation of the Establishment Officers of the Treasury and Ministry of Supply, together with their welfare workers.

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## CONGENITAL AGAMMAGLOBULINÆMIA

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A FAMILIAR problem to the physician is that of the child who is subject to frequently recurring upper respiratory infections. These first make their appearance when their host reaches an age at which he begins to mix with the community. Though the physician may feel somewhat helpless in the face of this troublesome sequence of infections, none of which are of any great severity, he can offer the anxious parents the assurance that the child's immunity responses are normal, and that in time he will outgrow this phase in development.

In recent years there have been reports of children, subject to recurring infections, who fall into a different category. In them the infections have been severe and almost always bacterial; they have usually appeared early in life, before their hosts can have had much contact with the community at large; and they have not been confined to the respiratory tract (Bruton 1952, Bruton et al. 1952, Janeway et al. 1953, Hayles et al. 1954).

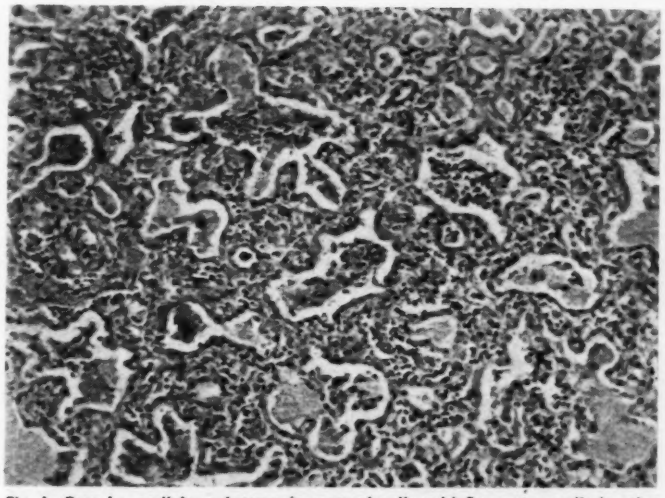

Fig. 1—Case 1: acellular substance in many alveoli, and inflammatory cells in other parts of the lung (× 110).

It seems that in these children, who have all been boys, there was a congenital defect in the formation of γ-globulin analogous to the hereditary defect of specific proteins seen in hæmophilia, Christmas disease, and afibrinogenæmia.

I have encountered one proven case and one probable case of this hereditary deficiency within the same family. Both ended fatally; but earlier recognition of the disease might have prevented at least one of these deaths.

## Case-reports

### FIRST CASE

On March 18, 1950, a male infant aged 6 months was admitted to hospital severely ill with bronchopneumonia. The total white-cell count was 11,400 per c.mm. (differential count normal). To our dismay, there was no response to penicillin, sulphonamide, and chlortetracycline (aureomycin), and the infant died on March 22, 1950.

The peculiar nature of the lung changes seen post mortem was not understood at the time, but they should be compared with those found three years later in case 2. There was no infection of the upper respiratory tract. The right lung weighed 130 g., the left 98 g. Both lungs were evenly congested and firm, and their cut edge was hard. The appearance would have suggested bronchopneumonia but for the absence of pus. Several blocks were cut for histological examination. The bronchioles had a thin exudate with macrophages and polymorphonuclears mingled with a variable quantity of blood. The alveolar picture was of four types: (1) frankly hæmorrhagic; (2) containing a polymorphonuclear exudate; (3) containing an exudate in which the inflammatory cell was a macrophage; and (4) extensive areas where a protein acellular substance filled the alveoli. The alveolar walls were thickened, and only the mildest interstitial fibrosis was seen. Often the alveolar lining cells were cuboidal (fig. 1). Culture of the lung was sterile.

### SECOND CASE

On Oct. 27, 1953, a male infant, aged 5 months, was admitted, who was a brother of the first. There were two other surviving brothers, aged 5 years and 2 years, and both the parents were in good health.

*Illnesses with Recovery*

When admitted he had been unwell for three weeks, with vomiting, diarrhœa, and loss of weight. He was a well nourished but remarkably hypotonic infant. There were no localising signs of disease. Stool culture yielded no pathogens. The plasma-carbon-dioxide content was 38·9 volumes per 100 ml. The plasma-chloride level was 551 mg. per 100 ml. and serum-calcium level 11·2 mg. per 100 ml. Hæmoglobin 12·6 g. per 100 ml. Red cells 5,400,000 per c.mm. White cells 8400 per c.mm. The symptoms subsided on dietetic treatment, and the baby was discharged from hospital on Nov. 3, 1953.

On Dec. 6, 1953, he was admitted to a fever hospital with meningococcal meningitis, from which he made a good recovery on sulphonamide treatment.

In July, 1954, while on holiday in Ireland, he was admitted to hospital gravely ill with pneumonia. This did not respond to penicillin, but a rather slow recovery took place on chlortetracycline. Radiography of his chest in Glasgow on Sept. 9, 1954, showed only somewhat prominent vascular shadows at the lung roots.

*Final Illness*

On Nov. 1 he again became ill with cough, fever, and dyspnœa. He was put on oral benzathine penicillin by the family doctor. When his illness did not respond to this, treatment was changed to crystalline chloramphenicol 250 mg. six-hourly on Nov. 4. He was admitted to hospital on Nov. 7. He was rather dyspnœic and had a spasmodic cough with slight pyrexia. Radiography of his chest showed extensive bilateral bronchopneumonia. The peculiar muscular hypotonia noted in October, 1953, was again obvious. A Mantoux test was negative. Hæmoglobin 14·7 g. per 100 ml. Red cells 5,200,000 per c.mm. White cells 14,100 per c.mm. (polymorphs 54%, lymphocytes 38%, smear cells 1%, metamyelocytes 2%, primitive lymphocytes 2%, monocytes 3%). The duodenal juice contained trypsin.

In view of the recurrent severe infections in a child with excellent home conditions the serum was subjected on Nov. 7, 1954, to electrophoretic analysis, which showed:

Total serum-protein level 7·52 g. per 100 ml.;
Albumin 5·22 g. per 100 ml. (69·4%)
$\alpha_1$-globulin 0·08 g. per 100 ml. (1·1%)
$\alpha_2$-globulin 1·35 g. per 100 ml. (17·9%)
β-globulin 0·80 g. per 100 ml. (10·6%)
γ-globulin 0·07 g. per 100 ml. (1·0%)

These figures should be contrasted with the normal distribution of serum-proteins (Hayles et al. 1954):

Albumin 59·2%
$\alpha_1$-globulin 5·9%
$\alpha_2$-globulin 11·0%
β-globulin 11·8%
γ-globulin 12·1%

In hospital chloramphenicol was continued for eight days, during which time, although afebrile, the baby was unimproved. He was then given intramuscular soluble penicillin plus oral sulphasomidine ('Elkosin') six-hourly for seven days followed by a daily intramuscular injection of benzathine penicillin for twenty days. During this period he became progressively more dyspnœic and cyanosed, even in an oxygen tent. Serial radiographs showed progressive spread of the pneumonic process until the lung fields showed almost no aeration at all. From Dec. 12 he was given chlortetracycline 75 mg. six-hourly. Intramuscular γ-globulin 500 mg. on Dec. 18 and 1000 mg. on Jan. 5, 1955, was without obvious benefit. Erythromycin, started on Jan. 13, was equally unimpressive in its effects. Other therapy included digoxin and vitamin-B complex.

The serum-proteins were again estimated on Dec. 30, after sixty days' severe infection:

Total serum-protein level was 4·76 g. per 100 ml.;
Albumin 3·50 g. per 100 ml. (73·6%)
$\alpha_1$-globulin 0·05 g. per 100 ml. (1·1%)
$\alpha_2$-globulin 0·58 g. per 100 ml. (12·2%)
β-globulin 0·56 g. per 100 ml. (11·6%)
γ-globulin 0·07 g. per 100 ml. (1·5%)

On Jan. 10 the boy developed œdema. He died on Jan. 16.

*Other Investigations*

A Schick test gave a positive reaction although he had been immunised against diphtheria at the age of 8 months.

His blood-group was O, and both anti-A and anti-B isoagglutinins were present. Each of these antibodies had a titre of 1 in 4 at room-temperature and at 4°C, and a titre

Fig. 2—Case 2: cut surface of lung, showing homogeneous appearance and lack of usual lung pattern.

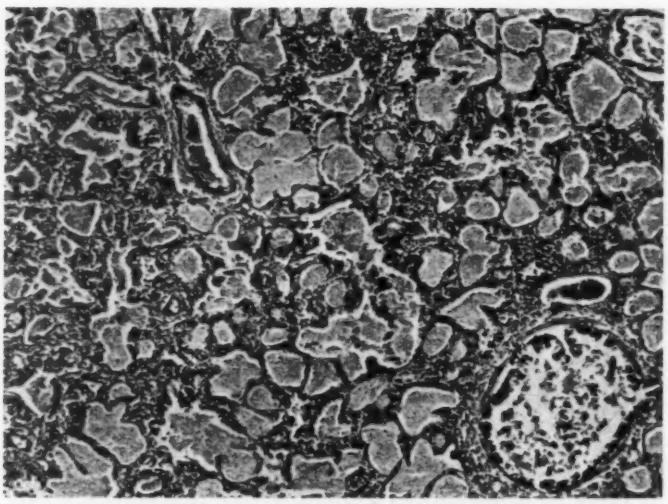

Fig. 3—Case 2: alveoli filled with acellular exudate, and some inflammatory cells in interstitial tissues (× 65).

of 1 in 2 at 37°C, which is abnormally low. The inhibitory effect of the baby's serum on rabbit's anti-human-globulin serum was also much smaller than usual.

The baby had been vaccinated at the age of 4 months. He had a typical scar on his left upper arm and had apparently reacted normally to inoculation with vaccinia virus. His serum was examined for vaccinia antibody by Dr. N. R. Grist, of Ruchill Hospital, Glasgow. The pock-counting method was used: the chorio-allantoic membranes of fertile eggs are inoculated with serum-virus mixtures, and the amounts of surviving virus are calculated by counting the numbers of virus lesions produced on the membranes. Several tests produced the following results:

| *Serum* | *No. of eggs inoculated* | *Average no. of lesions per egg* |
|---|---|---|
| Patient's inactivated at 56°C for ½ hr. | 5 | 70 |
| Patient's unheated | 4 | 18 |
| Normal rabbit's inactivated | 3 | 107 |
| Normal rabbit's inactivated | 3 | > 96 |
| Normal inactivated of unvaccinated adult | 3 | 80 |
| 6th-day serum from vaccinated infant, inactivated | 3 | 31 |

There was considerable neutralisation by the baby's unheated serum but not by the heated serum—which fact indicates the activity of heat-labile neutralising factors other than antibody (non-specific neutralising or potentiating factors). The baby's heat-inactivated serum did not give the 50% neutralisation of vaccinia virus which should be observed if antibody is present. Serum from an infant vaccinated six days previously, which had not been expected to contain antibody, neutralised the virus to a significant degree; vaccinia hæmagglutination-inhibition tests with this serum confirmed the presence of antibody. It is obviously more difficult to prove the complete absence of antibody than to demonstrate its presence, but the results of the tests fit in with the absence of vaccinia-neutralising antibody from the baby's serum.

*Post-mortem Findings*

The abnormal findings were confined to the lungs. Each lung was heavier than usual and had a smooth pleural surface. The right lung weighed 300 g., the left 250 g. On section the cut surface was homogeneous in appearance and lacked the usual lung pattern (fig. 2). The fine honeycomb appearance of the normal lung was absent, and when the tissue was squeezed no air escaped. Several pieces taken for histology sank in the fixative. The histology of the lung indicated an interstitial type of infection, the inflammatory cells being a mixture mainly of round cells with a few polymorphs and some macrophages. The alveolar walls were greatly thickened owing to this increase in cellularity, but there was no fibrosis. The alveolar capillaries were slightly congested but did not contribute materially to the thickening of the alveolar wall. Nearly every alveolus and respiratory bronchiole had an albuminous plug which had a fine reticular appearance not showing the staining reactions for fibrin as demonstrable by Gram's method (fig. 3). The periodic-acid Schiff reagent stained this plug pink. There was no blood pigment in the alveolar wall, and no bacteria were found. Culture of the lung was sterile.

The histological picture of the lung is quite unusual and very similar to that found in case 1, although there is less evidence of frank alveolar infection. It seems to indicate a type of interstitial pneumonia, but the nature of the exudate remains puzzling. The lung lesion had been present for some weeks, and the lack of fibrosis, which one would expect from a more usual type of interstitial pneumonia, is remarkable.

## Discussion

Case 2 probably had the same type of agammaglobulinæmia as that described originally by Bruton (1952) and later from the same and other American centres (Bruton et al. 1952, Janeway et al. 1953, Hayles et al. 1954). All the patients had been boys. The disease is probably congenital and may be a sex-linked inherited recessive characteristic. The histological appearances of the lungs in cases 1 and 2 are so similar and so unusual as to make it extremely probable that case 1 also had congenital agammaglobulinæmia. The appearance of two cases in a family of four boys would be quite in keeping with a sex-linked recessive mode of inheritance. Martin (1954) has reported the absence of γ-globulin from the sera of very small premature infants born at or before the twenty-sixth week, and has suggested that the syndrome of agammaglobulinæmia may be due to the persistence of the early fœtal pattern of the serum-proteins.

A perusal of the literature suggests that the absence of γ-globulin is rarely complete, and that there are several different types of deficiency. All the patients mentioned so far (including my own) have been boys who showed undue susceptibility to bacterial infections. By contrast they have shown an apparently normal response to the common virus fevers. On the other hand, although vaccination has led to a normal primary reaction, in most of the patients antibodies against vaccinia were absent, or present only in very low titres (as in case 2). Keidan et al. (1953) have reported a female infant who developed fatal generalised vaccinia after vaccination in

association with agammaglobulinæmia, and it is likely that this is not the same disease as that under discussion. Martin (1954) points out that only certain antibodies are associated with that area of the γ-globulin pattern which is observed to be deficient in the male cases and which appears to correspond to $\gamma_2$. It is reasonable to suppose that in the case described by Keidan et al. (1953) the nature of the deficient γ-globulins was not identical with those lacking in the boys. This selective deficiency of γ-globulins presumably explains the cases, such as that described by Schick and Greenbaum (1945), in which the absence of serum-γ-globulin was not associated with undue susceptibility to infection but with episodic œdema. Martin (1954) mentions the case of a woman with an almost complete absence of γ-globulin who produced antibodies on challenge. There have also been cases of agammaglobulinæmia in adolescents or adults (Grant and Wallace 1954, Sanford et al. 1954) who were subject to severe bacterial infections and showed evidence of deficient formation of antibody, and in whom the deficiency may have been acquired rather than congenital.

Finally, it is pertinent to observe that, if the diagnosis had been reached in case 1, it would probably have been possible to avert case 2's final illness by giving regular injections of pooled serum-γ-globulin. Janeway et al. (1953) found that their patients could be kept free from infection with 0·1 g. of γ-globulin per kg. of body-weight once a month. Agammaglobulinæmia may be less rare than has been supposed, and no doubt other sufferers have died from their first severe infection, as did case 1.

### Summary

The case of a male child subject to recurring severe bacterial infections, one of which proved fatal, is described. Electrophoresis showed an almost complete absence of γ-globulin from his serum.

This patient's brother had died previously of "pneumonia." The histological appearances of the lungs from both patients were so similar and so unusual as to make it highly probable that the brother too had had agammaglobulinæmia.

Serological studies revealed that the patient had failed to produce diphtheria antibodies in response to toxoid, and that, although his primary vaccination reaction had apparently been normal, vaccinia-antibody could not be demonstrated in his serum. There was an abnormally low titre of isohæmagglutinins anti-A and anti-B.

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"Disablement, irrespective of the nature of the disability, necessitates a readjustment of a person's mode of life. . . . Readaptation to this new world like any other of a similar kind, e.g., transplantation of an individual into a foreign country, is difficult. The foreigner, for instance, may hanker so much for his country of origin that he lives in the past and repudiates the present; or he may join the minority of those who are in a similar position; or, if he decides on adapting himself to the new environment, he may either make himself acceptable or, by overdoing it, may make a fool of himself. . . . All four modes of behaviour occur in the disabled. There is the ex-regular who still clings to the life that he loved; the embittered person who, alleging that fit persons fail to understand him, withdraws into the world of the disabled; the person who joins the fit and is accepted by them almost as one of them; and there is the disabled person who frantically, alas in vain, tries to pretend that he is not different."—E. D. WITTKOWER, *Canad. med. Ass. J.* 1955, **73**, 371.

## EFFECT OF PROLONGED LABOUR ON THE SERUM-UREA

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TOXÆMIA of pregnancy is well known to interfere with renal function, and this may be evidenced by a rise in the level of urea in the body-fluids of both mother and fœtus. Urea diffuses so readily across the membranes which separate the one from the other that, so long as the placenta remains in situ the level is always the same, or very nearly the same, in both.

Work in this department has shown that a prolonged and/or difficult labour may have an unfavourable effect on the tissue breakdown and renal function of the infant during the first two days of its life (McCance and Widdowson 1954). In the course of this work it was noticed that the cord serum tended to contain more urea after a prolonged and/or difficult labour than after a normal straightforward labour and delivery. This must have been a reflection of maternal, not of infantile, renal function; and, in order to establish the truth or otherwise of this observation, further material has been investigated.

UREA LEVELS IN BODY-FLUIDS OF NORMAL WOMEN AT THE TIME OF DELIVERY

| Nature of labour and delivery | No. of cases | Urea level (mg. per 100 ml.) | |
|---|---|---|---|
| | | Range | Average and S.D. |
| Normal .. .. .. | 24 | 12·5–31·2 | 20·6 ± 4·92 |
| Cæsarean section .. .. | 11 | 12·5–22·7 | 17·6 ± 3·29 |
| Prolonged and/or difficult .. | 13 | 18·3–68·3 | 37·5 ± 16·63 |

*Significance of difference between*: Normal and prolonged and/or difficult labour $t = 4{\cdot}50$, $p = < 0{\cdot}01$. Cæsarean section and prolonged and/or difficult labour $t = 3{\cdot}74$, $p = < 0{\cdot}01$.

The results are shown in the accompanying table. The women were either primiparæ or multiparæ, all without albuminuria or hypertension, and the cæsarean sections were "planned" and carried out before labour began, for reasons such as disproportion. All the women who had prolonged and/or difficult labours were primiparæ. Eleven of these women were in labour between 31 hours and 5 days. Of the remaining two, one had a normal first stage of labour but a prolonged second stage ($3^1/_2$ hours). The other had a 24-hour labour complicated by premature rupture of the membranes (12 hours), and a prolonged and very difficult second stage, which lasted 6 hours. The twenty-four normal deliveries included ten primiparæ.

It is evident that a prolonged and/or difficult labour may raise the level of urea in the maternal body-fluids. The cause may be some interference with renal function due to muscular exertion, a deviation of blood from the kidneys, or a fall in glomerular pressure; but it may also be due, as it is in the infants born after such labours, to an increased destruction of tissue protein. This in turn may be the result of "stress," or (in the mother) even of carbohydrate starvation. Only further work can decide.

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# THE RENAL FACTOR IN THE ALKALOSIS OF POTASSIUM DEFICIENCY *

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WHEN the cells of the body lack potassium, the extracellular fluid may become abnormally alkaline, though the cells are themselves more acid than normal (Cooke et al. 1952, Black and Milne 1952, Gardner et al. 1952). Studies made during the correction of potassium deficiencies suggested that a movement of $H^+$ ions from the extracellular fluid to the intracellular fluid accounted for the extracellular alkalosis, and that its production did not depend on the kidneys (Orloff et al. 1953). But it has always seemed that the kidneys must play some part in allowing the alkalosis to arise at all (Darrow et al. 1948).

The production of the extracellular alkalosis in a clinical deficiency of potassium can best be investigated in a patient who has not already got an alkalosis, and for our study we selected a patient whose deficiency of potassium accompanied a renal acidosis.

## Case-report

A woman, aged 38, who weighed 64 kg., was admitted to hospital because she had become paralysed after a period of increasing weakness, which had lasted 5 weeks. Before that she had been well except for an attack of renal colic 5 years before, when she had passed a stone; she also admitted to having been unusually thirsty for some months.

The level of potassium in her serum was only 1·8 m.eq. per litre, with sodium 139, chloride 111, and bicarbonate 14 m.eq. per litre. In spite of this extracellular acidosis her urine was nearly neutral (pH 6·5) and contained very little titratable acid or ammonia, indicating that her acidosis was of renal origin. The urine contained a trace of albumin but no pus cells, and cultures were invariably sterile. Neither stones nor calcification could be demonstrated in the kidneys, and an intravenous pyelogram revealed no structural change in them. The blood-urea level was 58 mg. per 100 ml. The clearance of inulin was 60 ml. per min., and that of *p*-aminohippurate 214 ml. per min. In spite of the low plasma-potassium level she was excreting about 40 m.eq. of potassium daily in her urine. The administration of 100 m.eq. of ammonium chloride daily for 2 days did not increase her excretion of acid or of ammonia and did not change the pH of her urine. An infusion of neutral phosphate also had no important effect (cf. Milne et al. 1952). Her serum-calcium level and her urinary excretion of calcium were normal.

When this patient was treated with potassium chloride and sodium bicarbonate, her potassium deficiency and her acidosis were rapidly corrected. But when we treated her acidosis with sodium bicarbonate alone, 30 g. daily, without correcting her potassium deficiency, this rapidly produced a severe extracellular alkalosis, and her plasma-bicarbonate rose to 45 m.eq. per litre. The same dose of sodium bicarbonate did not produce an alkalosis after her potassium deficiency had been treated with potassium chloride. Several weeks later she readily consented to an experimental study. After letting her become deficient in potassium again we investigated the ability of her kidneys to dispose of a large dose of bicarbonate—first sodium bicarbonate, and then potassium bicarbonate.

## Methods

The procedure for the metabolic balance followed that of earlier experiments (Fourman 1952). Aliquots of urine were analysed from daily collections and from pooled collections from each experimental period. The latter values were used to compute the cumulative changes. Blood was drawn from a wrist vein, without stasis, into heparinised tubes. The following chemical methods were used:

Potassium and sodium were estimated by flame photometry (Wallace et al. 1951), chloride in plasma and urine by potentiometric titration (Sanderson 1952) and in the fæces by van Slyke's method (Hawk et al. 1954), phosphate by Gomori's (1942) method, nitrogen and urinary ammonia by microdiffusion (Conway 1950), organic acids in the urine by van Slyke and Palmer's method (Hawk et al. 1954) after the urine had been stored for some time with hydrochloric acid 2% *v/v*, creatinine according to Roscoe (1953), plasma pH with a Stadie glass electrode at room-temperature (a correction of −0·014 pH unit per °C was applied for the difference from body-temperature), and urine pH colorimetrically with capillary tubes.

The experiment lasted 32 days, during which the patient took the same daily diet containing 59 m.eq. of potassium, 122 m.eq. of sodium, 111 m.eq. of chloride, 1·26 g. of phosphorus, and 9·1 g. of nitrogen. The study was divided into three parts:

(1) 18 days without treatment;
(2) 3 days with 357 m.eq. (30 g.) daily of sodium bicarbonate added to her diet;
(3) 11 days with 100 m.eq. (10 g.) daily of potassium bicarbonate, as well as the sodium bicarbonate, added to the diet.

## Results

*Period 1*

When at the beginning of this period, the patient's treatment with potassium chloride and sodium bicarbonate was withdrawn, she excreted more sodium and potassium than her diet provided. Table I shows her losses of potassium, sodium, and chloride and the resulting changes in the composition of her plasma. Her deficit of potassium at the end of the period was 340 m.eq., too small to produce any clinical changes but sufficient for the purpose of the experiment. She lost a much smaller amount of sodium and very little chloride. Her plasma-potassium level fell from 4·4 to 3·6 m.eq. per litre; her plasma-sodium level hardly changed. Her plasma-chloride level rose and her plasma-bicarbonate level fell correspondingly, and the pH of her blood at the end of the period was 7·26; hence the deficit of potassium was accompanied by an acidosis in the plasma. The packed-cell volume was 41% of her whole blood. Her clearance of endogenous creatinine, a measure of the glomerular filtration-rate, was 76 ml. per minute in this period.

TABLE I—LOSSES OF K, NA, AND CL DURING FIRST PERIOD OF 18 DAYS WITHOUT TREATMENT, AND COMPOSITION OF PLASMA AT BEGINNING AND END OF PERIOD

| — | Balance (m.eq.) | Plasma (m.eq. per litre) | |
|---|---|---|---|
| | | Beginning | End |
| K .. | Loss 340 | 4·4 | 3·6 |
| Na .. | Loss 114 | 139 | 135 |
| Cl .. | Loss 63 | 101 | 110 |
| $HCO_3$ .. | .. | 26 | 16 |
| pH .. | .. | .. | 7·26 |

*Period 2*

When we added sodium bicarbonate 357 m.eq. daily to her diet, she became thirsty and drank more water but excreted less urine; in 3 days she gained 3 kg. in weight and her face and legs became œdematous (cf. Fourman and Hervey 1955). On the 2nd day Trousseau's sign was elicited, and on the 3rd day she had spontaneous tetanic spasms in her hands and feet. Table II shows the chemical changes in this period. She continued to lose potassium, but her kidneys excreted only a fraction of the sodium she had taken, and in the

* Paper presented to the Association of Physicians of Great Britain and Ireland in May, 1955.

TABLE II—CHANGES IN AMOUNTS OF K, NA, AND CL IN BODY AND COMPOSITION OF PLASMA AFTER ADDITION OF 357 M.EQ. OF $NAHCO_3$ TO DIET FOR 3 DAYS

| — | Balance (m.eq.) | Plasma (m.eq. per litre) |
|---|---|---|
| K | Loss 35 | 2·4 |
| Na | Gain 780 | 145 |
| Cl | Gain 23 | 91 |
| $HCO_3$ | .. | 39 |
| pH | .. | 7·55 |

3 days of this period the amount of sodium in her body increased by 780 m.eq.; the amount of chloride in her body did not increase. Her plasma-potassium level, which had already fallen in the first period, fell further now to 2·5 m.eq. per litre. Her plasma-sodium level rose by 10 m.eq. to 145 m.eq. per litre; but her plasma-chloride level fell by 19 m.eq. to 91 m.eq.; and her plasma-bicarbonate level rose by 23 m.eq. to 39 m.eq. The pH of her blood was now 7·55; so she had a severe extracellular alkalosis. The packed-cell volume was 36% of her whole blood. Her glomerular filtration-rate was 74 ml. per minute, virtually the same as in the first period.

*Period 3*

When we now added potassium bicarbonate 100 m.eq. daily to her intake of sodium bicarbonate, her tetany promptly diminished, and after 4 days there was no sign of it. Her weight then decreased, and in the following 7 days she lost her œdema.

Table III shows the chemical changes in the first 4 days of this period. She gained 265 m.eq. of potassium. Her kidneys were now excreting all the sodium she was taking and more, with the result that her body lost 90 m.eq. of sodium; and they excreted less chloride than she was taking, with the result that she gained 155 m.eq. of chloride. The analyses of each day's collection of urine revealed that the excretion of chloride decreased on the first day that potassium bicarbonate was given. Her plasma-sodium level fell to its original value of 135 m.eq. per litre, her plasma-chloride rose, and her plasma-bicarbonate fell. Her alkalosis was largely corrected, and the pH of her blood became normal again.

Table III also shows the chemical changes in the last 7 days of the experiment, when she lost weight (see figure). She gained a further 258 m.eq. of potassium, more than enough to correct her original deficit; and she lost 302 m.eq. of sodium and 132 m.eq. of chloride. At the end of the experiment the composition of her plasma was normal. Her glomerular filtration-rate was 71 ml. per minute.

The results of the other chemical analyses need not be described in detail. During the whole experiment the excretion of nitrogen did not change significantly. The excretion of phosphorus did not change appreciably until the second period, when sodium bicarbonate was given. The amount of phosphate in the urine then decreased, by 240 mg. daily, and it

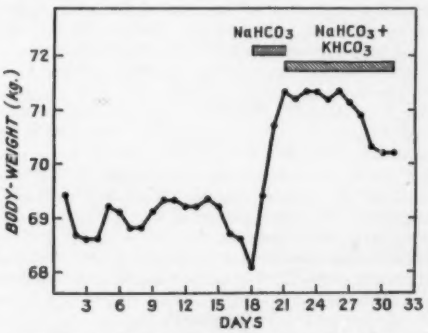
TABLE III—CHANGES IN AMOUNTS OF K, NA, AND CL IN BODY AND COMPOSITION OF PLASMA AFTER ADDITION TO DIET OF 100 M.EQ. OF $KHCO_3$ AS WELL AS 357 M.EQ. OF $NAHCO_3$ FOR 11 DAYS

| — | Balance (m.eq.) | Plasma (m.eq. per litre) |
|---|---|---|
| *First 4 days:* | | |
| K | Gain 265 | 3·3 |
| Na | Loss 90 | 135 |
| Cl | Gain 155 | 96 |
| $HCO_3$ | .. | 31 |
| pH | .. | 7·34 |
| *Subsequent 7 days:* | | |
| K | Gain 258 | 5·5 |
| Na | Loss 302 | 135 |
| Cl | Loss 132 | 101 |
| $HCO_3$ | .. | 29 |
| pH | .. | 7·32 |

remained small at the beginning of the third period. The pH of her urine was 7·2 initially and decreased to 6·8 before the sodium bicarbonate was given; it then increased to 8·3 and remained about the same after that. The excretion of ammonia averaged 31 m.eq. daily in the period without treatment. At the height of the alkalosis it was 20 m.eq. daily, and it averaged 9·5 m.eq. daily while potassium bicarbonate was given. The changes in the excretion of organic acids, though small, were in the same sense as found by Cooke et al. (1954). The excretion was initially 93 m.eq. daily and decreased to 60 m.eq. daily during the first period. In the second period it was 64 m.eq. daily; during the first 4 days that potassium bicarbonate was given it increased again to 82 m.eq. daily, and it averaged 72 m.eq. daily after that.

## Discussion

The administration of sodium bicarbonate 30 g. daily produced rapidly a severe extracellular alkalosis on the two occasions the patient was deficient in potassium. This amount of sodium bicarbonate does not normally produce an alkalosis (van Goidsenhoven et al. 1954), and we have also established that it did not do so




**Changes in weight during 3 periods of experiment.**

in our patient when her stores of potassium were nearly normal.

The experimental observations suggest the following mechanism for her alkalosis:

(1) In 3 days she retained 780 m.eq. of sodium out of 1070 m.eq. taken. Her glomerular filtration-rate had not fallen, and her failure to excrete the sodium could only be explained by assuming that her renal tubules absorbed too much of it.

(2) At the same time she retained 3 litres of water, shown by her sudden gain in weight. She became œdematous, and from the change in her hæmatocrit it can be calculated that (if the total volume of her red cells did not change) the volume of her plasma increased by 23%. Thus the volume of her extracellular fluids had increased.

(3) She did not retain a significant amount of chloride; hence the chloride in her extracellular fluid became diluted, and her plasma-chloride level fell—by 17% of its original value. The concentration of the bicarbonate ion increased to take the place of the chloride ion, and her extracellular alkalosis was established.

The part played by her kidneys in the production of her extracellular alkalosis was therefore to reabsorb too much sodium and too little chloride from the glomerular filtrate. Rats' kidneys seem to do the same when they are deficient in potassium (Cooke et al. 1954, Schwartz et al. 1953, Orent-Keiles and McCollum 1941) but the changes in the function of the rats' kidneys was not measured directly.

Sodium is reabsorbed either in exchange for another cation or with an anion. In our study the sodium reabsorbed in excess of chloride could not have been reabsorbed by an exchange with H, K, or $NH_4$ ions (whose excretion hardly changed) and it must have been reabsorbed with an anion. Only some of this was phosphate; so most of the excess of sodium reabsorbed

must have formed bicarbonate. The result would be an apparent increase in the reabsorption of the bicarbonate filtered through the glomerulus, as Roberts et al. (1955) found when they infused sodium lactate into patients deficient in potassium.

The renal response we found during an extracellular alkalosis with potassium deficiency is what might ordinarily be expected during an acidosis; and the intracellular acidosis of potassium deficiency may determine the paradoxical response of the kidneys to the accompanying extracellular alkalosis, as Roberts et al. (1955) have also suggested.

When the patient was given potassium bicarbonate, her kidneys excreted sodium and retained chloride—i.e., they were responding normally to an alkalosis and in this way were able to correct her extracellular alkalosis. It is quite remarkable that they began to do this on the day she first had potassium and therefore before there had been any great change in the total deficit of potassium in her body. When potassium is given to a healthy animal, a disproportionate amount is taken up by the kidneys, to be released to the rest of the body only later (Emery et al. 1955). This might enable the kidney cells to return to a normal composition before the other cells of the body during the correction of a deficiency.

The therapeutic implications of this experiment may be mentioned. Firstly, the abnormal alkalosis produced by sodium bicarbonate in patients with pyloric stenosis (van Goidsenhoven et al. 1954) may possibly be related to a deficiency of potassium (Black and Jepson 1954) as well as of chloride. Secondly, it may be dangerous to treat an acidosis with free doses of alkali if the patient also has a deficiency of potassium. An extracellular alkalosis may result which the kidneys cannot rectify, and it may be advisable to add potassium to the treatment.

### Summary

Sodium bicarbonate 30 g. daily given to a patient with potassium deficiency produced a severe extracellular alkalosis. During the period of this extracellular alkalosis her kidneys reabsorbed too much sodium and water, and she gained 780 m.eq. of sodium and 3 litres of water. But her kidneys did not reabsorb chloride in corresponding amounts, and there was no gain of chloride.

When potassium bicarbonate was subsequently added to her treatment, her extracellular alkalosis was rapidly corrected; her kidneys were then excreting sodium and retaining chloride. This is the normal response to an alkalosis.

The abnormal response of the kidneys during a potassium deficiency may perhaps be ascribed to the intracellular acidosis which accompanies a potassium deficiency.

We are indebted to the patient, first of all, for her willing coöperation; to Dr. J. W. Keyser and Mr. S. E. Nethercott, of the Biochemical Laboratory, for many analyses of plasma; to Miss G. H. Powell and Miss J. W. Hosegood for help with the diet; and to Mr. E. Morgan and Miss M. Williams for their technical help. M. G. F. holds the Cardiff Royal Infirmary research fellowship in medicine.

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# PENNYROYAL POISONING

## A FATAL CASE

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PENNYROYAL has long had a reputation as an abortifacient, although its action is known to be unpredictable and even dangerous. In the following case it produced abortion, vaginal bleeding, hæmolytic anæmia, and acute tubular necrosis of the kidney, with death from uræmia.

Pennyroyal is a volatile oil and belongs to the same group as apiol, turpentine, and the oils of savin, tansy, saffron, and rue. It is prepared by distillation of *Mentha pulegium* which is found in Spain, the south of France, and Algeria (*Extra Pharmacopœia* 1952). Its active constituent, pulegone, is one of the several ketones belonging to the monocyclic terpenes. In the rat, its oral administration leads to the formation of menthol, which is excreted in the urine as a glucuronide (Williams 1947). Volatile oils owe their reputation as abortifacients to the fact that they irritate the genito-urinary tract and cause pelvic vascular congestion which may stimulate the uterus to abort. Their action is essentially a toxic one, and may produce severe abdominal pain, hæmatemesis, diarrhœa, hæmaturia, oliguria, anuria, convulsions, and loss of consciousness (Goodman and Gilman 1941).

When, formerly, oleum pulegeii was given by doctors to encourage menstruation, the dosage was about 1–3 minims. One teaspoonful of the oil has been known to produce convulsions, and at least one case is on record where a patient recovered from coma following ingestion of 15 ml. of the essence of pennyroyal (prepared by dissolving oil in rectified spirit) (Braithwick 1906). Pennyroyal was deleted from the *British Pharmaceutical Codex* in 1934, but it is still quite easily obtainable by the public from a chemist's shop. It used to be sold for "obstructed menstruation," hysterical complaints, and whooping-cough.

### Case-report

Mrs. A., aged 24, was admitted to a general medical ward at 8.15 P.M. on Oct. 15, 1954, with a tentative diagnosis of drug-sensitivity reaction. She had visited her doctor on the previous day, complaining of general malaise, for which he gave her some codeine tablets. Three hours before her admission he was called to see her because she had suddenly developed a widespread rash and pyrexia.

The ward-sister discovered she had severe vaginal bleeding, and her story was elicited. Wishing to terminate a three months' pregnancy, she had bought a bottle of pennyroyal mixture and had taken this on the evening of Oct. 14. Next morning she had bought a further bottle, consumed its contents, and had a hot bath. Several hours later she had had an abortion, followed by heavy bleeding, and shortly after this she developed a widespread rash.

On admission, she complained of nausea, vomiting, abdominal pain, and diarrhœa. There was no history of ill health, and she was the mother of two healthy children.

She was a well-nourished woman: temperature 100°F; pulse-rate 130 per min.; respirations 30 per min. On her face, trunk, and upper limbs and the proximal third of the lower limbs, there was a diffuse, non-itching, slightly elevated,

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erythematous rash. The conjunctivæ were injected. There was slight tenderness in the loins and the suprapubic zone. Blood-pressure was 120/70 mm. Hg. There was some vaginal bleeding, and the findings on pelvic examination were compatible with a three months' complete abortion. The other systems appeared normal.

*Course of Illness*

She passed 2 oz. of urine that evening, but no more until shortly before her death, when she had a brisk diuresis.

On the day after admission she continued to vomit occasionally, and complained of some headache. There was still moderate vaginal bleeding, but her colour was remarkably good. Her blood-urea was 88 mg. per 100 ml. Next day (Oct. 17), she looked rather pale, and slightly icteric. Her hæmoglobin was 24% (3·8 g. per 100 ml.), and the leucocyte-count was 25,400 per c.mm. (polymorphs 19,500, lymphocytes 3250, monocytes 1750, eosinophils 250), with normoblasts 250 per c.mm. A film showed anisocytosis, microcytosis, and moderate reticulocytosis. The blood-serum was dark brown and methæmalbumin was seen on spectroscopy.

On Oct. 17 she was transfused with 2 pints of packed cells and placed on Bull's régime: fluids were restricted to 1 litre per day all her vomitus being filtered and returned to her stomach by Ryle's tube. She was also given antibiotics.

Next day (Oct. 18) her blood-urea was 410 mg. per 100 ml. Her rash had faded to a coppery brown, and there was no vaginal bleeding; but her liver was now palpable three finger-breadths below the costal margin. The liver-function-tests (alkaline phosphatase, colloidal gold, and serum albumin-globulin ratio) were repeated on several occasions, but apart from a slight elevation of the serum-bilirubin (of the order of 1·8 to 2·2 mg.) they were normal. Estimations of electrolytes and of the $CO_2$-combining-power of the serum remained nearly within the normal range until three days before death.

Her general condition was fairly satisfactory until Oct. 25, when she had epistaxis and became increasingly drowsy. She next developed pneumonia with acidotic respirations, and she died on Oct. 28. Shortly before death her blood-urea was 646 mg. per 100 ml.

*Necropsy*

The kidneys were swollen and dark-red. The capsule stripped easily, and the exposed surface showed numerous pin-point hæmorrhagic spots. The cortex and medulla showed fair differentiation, and the cortex appeared hæmorrhagic. The ureters showed minor inflammatory changes. The suprarenals were normal.

There was a considerable degree of gastritis, and petechial hæmorrhages in the gastric mucosa. The duodenum, ileum, and colon were normal. The liver showed slight fatty changes, with some purpura in the right lobe. The brain was œdematous. The pleural cavities contained a pint of dark, serous effusion, and there was patchy consolidation of the lower lobes of both lungs. The myocardium appeared degenerate, and there were petechial hæmorrhages in the endocardium of the left ventricle.

*Histology*

The collecting-tubules of the kidneys contained large amounts of brown, hæmatogenous pigment, and a few pigment-laden macrophages. There were collections of inflammatory cells in the medullary interstitial tissue (mainly lymphocytes with a few plasma-cells, histiocytes, and eosinophils). Most of the distal convoluted tubules were packed with hæmoglobin or protein casts. There was considerable degeneration of the proximal convoluted tubules. The glomeruli and blood-vessels were normal apart from some congestion of the medullary vessels. The picture was that of acute hæmolysis or "transfusion kidney."

The liver appeared relatively normal apart from slight centrilobular cloudy swelling. The uterus showed normal postpartum changes.

### Comment

**It has not been possible to ascertain how much pennyroyal this patient took; but, as mentioned earlier, the effect of the drug on any particular person is unpredictable. Analysis of the liver, kidney, bladder, and intestines did not show the presence of any volatile oil, but as the examination was made 14 days after ingestion, a negative result was not unexpected. In this case there was no lesion of the central nervous system, and all tissues damaged, apart from the kidneys, appeared to recover fully. The anæmia was due to severe blood-loss and also partly to intravascular hæmolysis; but the patient did not look as though she had lost much blood, and her initial hæmoglobin of 24% came as a considerable surprise; possibly the formation of methæmalbumin partly masked her anæmia. It seems that the renal lesions were caused partly by a toxic effect of the pennyroyal, and partly by the hæmolytic reaction.**

**The patient survived for a relatively long time, and her terminal blood-urea of 646 mg. per 100 ml. was unusually high.**

I wish to thank Dr. J. K. Rennie for permission to publish this case, and Dr. H. S. Kellett and Dr. J. Eastwood for help with the histological and necropsy findings.

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## PROLONGED TREATMENT OF THE SCHÖNLEIN-HENOCH SYNDROME WITH CORTICOTROPHIN

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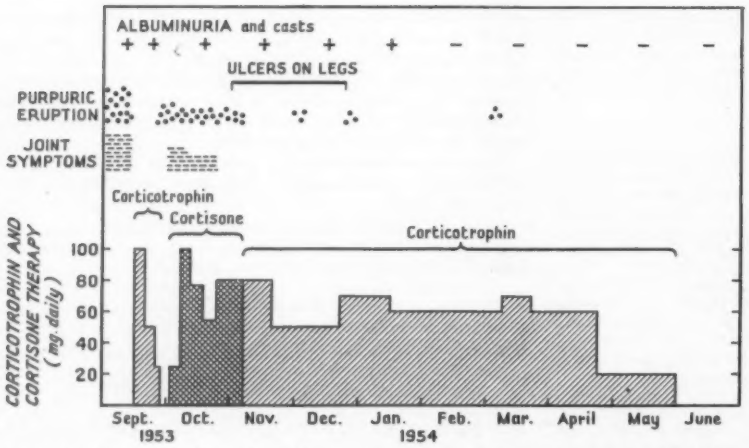
CLINICALLY, pathologically, and ætiologically the Schönlein-Henoch syndrome has been linked with other allergic diseases—acute nephritis, rheumatic fever, and polyarteritis nodosa (Gairdner 1948). Two of these diseases may coexist, and various allergic manifestations may occur in the same patient at different times. The following report is of a man who has suffered from three major allergic conditions during his lifetime and has made a good recovery on each occasion. His most recent illness was the Schönlein-Henoch syndrome, and his recovery seems to have been assisted by prolonged therapy with corticotrophin.

### Case-report

A man, aged 55, was admitted to the Central Middlesex Hospital on Sept. 2, 1953, with the following history. At the age of 2 years he had scarlet fever. At the age of 6 years he was in bed for several weeks with a severe illness characterised by aching in the joints and muscles; the condition was called rheumatic fever. He slowly recovered, and his heart was not permanently damaged. At the age of 49, three weeks after a sore throat, he was admitted to hospital in left ventricular failure. He then had a blood-pressure of 210/130 mm. Hg, œdema of his face and legs, and a large amount of blood and albumin in his urine. He made a good recovery from this illness (Ellis type-1 nephritis). Two months later his urine was clear and his blood-pressure had dropped to 130/90 mm. Hg; it remained at this level. An electrocardiogram was normal, and a chest radiograph showed no cardiac enlargement. The patient remained well for six years, but in August, 1953, he had a sore throat. A week later he developed colicky abdominal pain and swelling and aching of the knees, ankles, and wrists, followed in two days by a purpuric eruption on the limbs. There was no history of drug taking.

*On examination* his throat was inflamed. The purpuric eruption appeared in crops, and individual lesions ranged from the size of a pin's head to 1 cm. in diameter; some of the lesions were on an urticarial base and were palpable. His wrists and knee-joints were painful on movement and swollen. No abnormality was found in his heart and lungs; his blood-pressure was 140/90 mm. Hg. Shortly after admission he passed a melæna stool.

*Investigations.*—His urine on admission contained no excess of red cells, no casts, and no albumin. Examination of his blood showed white cells 18,000 per c.mm. (neutrophils 74%, lymphocytes 24%, eosinophils 1%, monocytes 1%) and platelets 160,000 per c.mm. His bleeding-time was $3\frac{1}{2}$ minutes, clotting-time 9 minutes, and erythrocyte-sedimentation rate 7 mm. in the 1st hour (Westergren). A chest radiograph was




**Correlation between corticotrophin and cortisone therapy and signs and symptoms of Schönlein-Henoch syndrome. (1 mg. of corticotrophin = 1 i.u.)**

normal. The Hess test was negative after 5 minutes, but half an hour later a large crop of purpuric lesions appeared on the hand and forearm distal to where the cuff had been. Schönlein-Henoch syndrome was diagnosed.

*Progress and Treatment.*—His joint symptoms persisted, and further crops of purpura developed during the next fortnight in spite of rest in bed and anti-histamine therapy. In addition, further specimens of urine were found to contain hyaline and granular casts. He was therefore given intramuscular corticotrophin 25 mg. six-hourly. Improvement was rapid: twenty-four hours later his joint pains had gone, and no further purpuric eruptions developed. His improvement was maintained until the dosage of corticotrophin was decreased to 12·5 mg. twice daily, when a few purpuric spots reappeared on both feet (see figure). More eruptions appeared, and his knee-joints and ankle-joints became swollen again, although cortisone was substituted for corticotrophin and the dosage raised to 100 mg. daily by mouth. Casts continued to appear in his urine. As soon as intramuscular corticotrophin therapy was started again in doses of 25 mg. thrice daily the condition again became controlled. Two ulcers, each 4 cm. in diameter, developed just above the ankles; these were due to purpuric eruptions breaking down in the early stage of the disease. Such ulcers are uncommon in the Schönlein-Henoch syndrome (Horler and Truelove 1955). They healed within three months on corticotrophin therapy. A protective dressing was applied locally, and the legs were supported by stockinet bandages. The abnormal constituents of the urine disappeared within five months, and no further evidence of renal damage developed.

*Follow-up.*—The patient returned to his work as a caterer within three months of the onset of symptoms and has remained well, except that at the end of a very busy day he occasionally gets a few purpuric spots on his feet. Corticotrophin therapy was continued, with an average daily dosage of 50 mg., for nine months and was then stopped because he remained symptomless. There has been no relapse during a further period of nine months. At no time did he develop any untoward side-effects of therapy.

## Discussion

Prolonged therapy with corticotrophin and cortisone of the Schönlein-Henoch syndrome has not previously been reported; their value has been variously assessed when they have been given for short courses.

Adamson et al. (1953) reported rapid improvement in a girl, aged 13, after the administration of corticotrophin 10 mg. twice daily; the improvement was later maintained on oral cortisone and persisted after the end of treatment, which lasted fourteen days, and there was no nephritis. For the following fortnight small crops of petechiæ were the only complication.

Kugelmass (1951) reported four cases in which children responded well on cortisone therapy for up to three weeks; in one case he was treating a relapse, and renal symptoms had been present on both occasions.

Levinson et al. (1951) found that each of two courses of corticotrophin was followed by prompt and progressive improvement of constitutional, joint, and skin symptoms in a girl aged 15. The first course was 100 mg. a day for four days; the second started with 100 mg. daily, and the dosage was gradually reduced over eight weeks. Exacerbations occurred after the withdrawal of corticotrophin on both occasions, and there was no beneficial effect on renal manifestations already present.

Stefanini et al. (1950) reported that corticotrophin 210 mg. in fourteen days given to a boy aged 3 years was associated with improvement in the abdominal and skin lesions but did not prevent a mild chronic glomerulonephritis.

Woolley (1952), however, found no response in a boy, aged $3\frac{1}{2}$ years, who received 640 mg. of corticotrophin in nineteen days; crops of petechiæ and abdominal colic continued during the treatment and the renal condition did not improve.

Similar failures were reported by Philpott and Biggs (1953) in nine children treated with corticotrophin and cortisone. These workers concluded that, when these drugs were used for three weeks or less, they neither prevented relapses and the onset of nephritis nor had any effect on the nephritis.

There were two reasons for the prolonged use of corticotrophin in the present case. Firstly, the treatment produced a dramatic cessation of symptoms both initially and when it was given again in adequate dosage after a relapse. This therapy kept the disease quiescent and enabled the patient to return to and remain at full employment within three months of the onset of his illness.

Secondly, corticotrophin was given to prevent the development (in the present case a recurrence) of nephritis, which is a major complication of the Schönlein-Henoch syndrome. In Gairdner's (1948) series eleven of twelve patients developed hæmaturia, one died of nephritis, two were left with chronic nephritis, and two others had persistent albuminuria. In the present case the finding of granular casts in the urine indicated renal involvement, and, after the start of treatment, no other signs of nephritis developed and the abnormal constituents of the urine gradually disappeared.

## Summary

The case is reported of a man who has at different times had three major allergic diseases—rheumatic fever, acute nephritis, and the Schönlein-Henoch syndrome—and apparently recovered from each.

The Schönlein-Henoch syndrome was treated with corticotrophin. There was a dramatic improvement at the beginning of treatment and again when corticotrophin was given again in adequate dosage after a relapse during treatment with a small dose of corticotrophin and later with cortisone.

Prolonged therapy with corticotrophin was given in an attempt to prevent further relapses and because there were signs of renal involvement. When therapy was finally discontinued after nine months, the patient was apparently cured, and he has remained so for a further nine months.

My thanks are due to Dr. K. P. Ball for permission to publish and for helpful criticism; and Mrs. I. Prentice for the chart.

*References at foot of next column*

# Medical Societies

## ROYAL SOCIETY OF MEDICINE

### Hypersensitivity and the Collagen Diseases

THE section of experimental medicine, with Dr. E. E. POCHIN in the chair, met on Oct. 11 to discuss Hypersensitivity and the Collagen Diseases.

Dr. E. G. L. BYWATERS outlined Klemperer's concept of a group of " collagen diseases " with the characteristic fibrinoid changes in their lesions. A list of such conditions would include disseminated lupus erythematosus, rheumatoid arthritis, rheumatic fever, Schönlein-Henoch syndrome, polyarteritis nodosa, and possibly calcinosis, scleroderma, and dermatomyositis. Hypersensitivity was an abnormal reactivity to antigen or haptene, due to antibody. The generalised features of the phenomenon were first recognised clinically in Von Pirquet's description of serum sickness in 1903. The clinical manifestations subsequently recognised could be classified in three main groups: (1) asthma, hay fever, infantile eczema, and hives; (2) serum sickness, contact dermatitis, and drug allergy; and (3) bacterial allergy. A fourth group was possibly the result of auto-immunisation. Evidence that the " collagen-disease " group resembled the known hypersensitivities was not striking. Experimentally, streptococcal infections often produced myocardial lesions said to resemble Aschoff bodies, but was this type of observation relevant? The strongest case for hypersensitivity was found in disseminated lupus erythematosus, where a serum gamma-globulin fraction (probably an inactivator of desoxyribonuclease inhibitor) was responsible for the well-known L.E.-cell phenomenon. The fibrinoid in disseminated lupus was probably derived from the hæmatoxylin bodies found in the connective tissue. In some cases, a positive Coombs test was found, and purpura or hæmolytic anæmia might be present. Although there was a relation between lupus erythematosus and rheumatoid arthritis in a few cases, the only evidence for hypersensitivity in the latter was the presence of plasma cells and raised gamma-globulin.

Future work would include extension of the simple measure of removing the patient from suspected antigens in his environment. Patch and scratch tests, and passive transfer of cells or serum supposedly containing antibody, were unlikely to be useful, even if more knowledge of the related antigens was forthcoming. The classical in-vitro methods of immunology were useless; progress awaited an enlargement of our knowledge of cell-fixed antibody.

Dr. G. A. ROSE spoke of infections and their treatment in the ætiology of polyarteritis. He said that although the textbooks categorically incriminated hypersensitivity in this condition there was little good corroborative evidence of this. Drugs, especially sulphonamides, were much blamed, but it was seldom clear whether drug treatment had really preceded the true onset of polyarteritis, or whether exacerbations were consistently produced by the drug. The evidence was strongest against thiouracil. In a survey of 111 cases of polyarteritis for the Medical Research Council, Dr. Rose had reached tentative conclusions. There was a frequent association with bronchiectasis, chronic bronchitis, and acute streptococcal respiratory infections. The infection itself, and not the drug used in treatment, was the probable cause of the onset of the disease in these cases. Where sulphonamides were apparently associated, it was usually because of a respiratory infection that they were used. A disproportionately high incidence of rheumatic fever or a history of it in his series (12%) supported the ætiological rôle of the streptococcus.

Prof. G. PAYLING WRIGHT dealt with three examples of experimental allergic lesions in animals. In diffuse serum arteritis of rabbits, intravenous serum-protein gave rise eventually to acute intimal and medial vascular lesions, which showed swelling of collagen fibres and the appearance of fibrinoid, followed by reparative processes. Such experiments had been amply confirmed, but nearly always using horse serum, in rabbits. The vessels affected were mainly those in the heart. The resemblance to human polyarteritis was not close. Studies with other antigens and other species might throw more light on the problem. The second example was experimental acute encephalomyelitis, produced originally in monkeys injected with homologous brain emulsion. The later use of adjuvants enabled the lesions to be produced in dogs, rabbits, and guineapigs, and much accelerated their appearance and increased their incidence. The cellular reaction of which the lesion consists is usually centred upon a venule, and is often accompanied by demyelination; subsequently gliosis occurs. There was little doubt that such lesions are allergic in character; but it seemed very unlikely that the group of human demyelinating diseases of the central nervous system were also all allergic in origin. The experimental conditions of the animal diseases were highly artificial.

In experimental acute glomerulonephritis, his third example, Professor Payling Wright described two techniques used. " Masugi " nephritis was produced by a cytotoxic anti-rat-kidney serum; fixation of antibody on the glomerular membrane had been shown by the fluorescein-labelling technique of Coons. Serum-nephritis was produced in rabbits rendered hypersensitive by large quantities of intravenous horse serum.

In human glomerulonephritis, there was the possibility that there was kinship between a streptococcal antigen and a component of the glomerular membrane. The association of type-12 streptococci with nephritis might be due to such a coincidence. Alternatively, a streptococcal antigen might become fixed in the kidney, and its combination with the antibody it evoked might lead to the lesion.

Dr. D. A. LONG described the clues which he thought, in general, the experimental pathologist might find worth following in the collagen diseases, which were systemic diseases of primitive mesenchyme affecting heart, blood-vessels, and serous membranes, and associated with hyperglobulinæmia and lymphadenopathy. Neuberger had shown that gamma-globulin (which was anabolised outside the liver) was closely associated with collagen, in the rat.

A common factor in these diseases was their response to cortisone. In choosing an experimental animal, one should consider that man was resistant to cortisone, and in this respect the monkey and the guineapig were similar. The mouse, rabbit, rat, and ferret were relatively sensitive. Species were similarly divided in their susceptibility to delayed bacterial allergy of the tuberculin type. Although majority opinion favoured immediate anaphylactic hypersensitivity as the probable causal reaction in, say, rheumatic fever, Dr. Long took the opposite view that delayed allergy was more likely to be operating. He described some of his own experiments relating these considerations to ascorbic-acid metabolism, to sulphydryl metabolism, and to the relationship between the adrenal cortex and the islets of Langerhans.

Prof. R. J. V. PULVERTAFT showed two short films of time-lapse cinematography showing some stages in the formation of L.E. cells in the bone-marrow, and the absence of toxicity of an isoniazid-sensitised patient's serum on the marrow granulocytes. This included a striking demonstration that megakarocytes rotate.

DR. LEESE: REFERENCES

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# New Inventions

## A RETRACTOR FOR CHOLECYSTECTOMY

SELF-RETAINING retractors for abdominal surgery have had a limited scope. They are commonly used for the incisions through or near the midline, and they work best in thin patients, for whom they are hardly required. All the many types—even the frame retractors—often fail miserably in adipose patients. The usual answer, therefore, is multiple assistants holding retractors with very long blades—a practice not always conducive to easy safe manipulations at a depth.

For about twelve years I have used for cholecystectomy a prototype of the retractor here illustrated, and I am convinced that it has added to the ease and therefore safety of the operation, especially in very fat patients.

The retractor works best with a Kocher incision with slight lateral tilt of the operation table to the left, but no elevation of the bridge is required. Any adhesions to the fundus of the gall-bladder should be divided before the usual packs and the retractor are inserted. The smaller upper part of the larger blade retracts the muscular part of the abdominal wall: the larger lower

Fig. 1—The retractor.

portion retracts the intestines covered by the packs. The distance between the anterior and posterior parietal peritoneum does not vary very much: it is the depth of subcutaneous fat which varies considerably. The smaller blade merely retracts the costal margin, which acts as a fulcrum without interfering with the mobility of the liver and gall-bladder. A third blade can be inserted which leaves the assistant's hands free for his other essential duties besides retraction. The shafts of all the blades are cranked so that the handles are clear of the skin and subcutaneous fat.

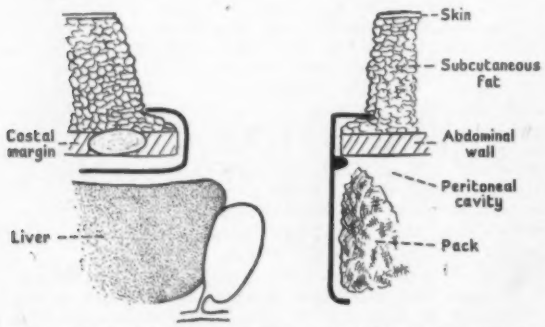


Fig. 2—Diagram showing how the two main blades of the retractor are placed.

I am grateful to Messrs. Chas. F. Thackray for their patience in constructing the retractor after two previous models, one on the Gosset principle, had not proved quite satisfactory.

M. J. BENNETT-JONES
United Liverpoo lHospitals CH.M. Lpool, F.R.C.S.

## DISSECTOR AND LIGATURE-PASSER

THE pattern of dissector and "ligature passer" described here has been in use now for over twenty years. I have found that it greatly facilitates the ligaturing of vessels when performing operations upon the stomach and colon.

The idea of an instrument of this type occurred to me while watching Prof. Hans Finsterer perform a partial

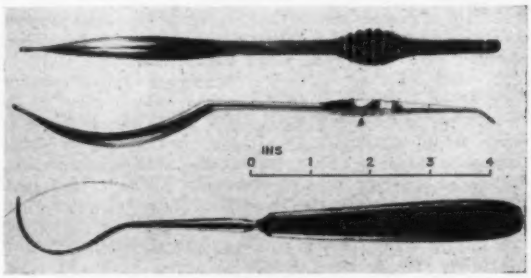


Fig. 1.

gastrectomy for duodenal ulcer in Vienna in 1931. Professor Finsterer was very careful to detach the great omentum from the stomach without interfering with the omental blood-supply, and he did this by passing under each gastric branch of the epiploic artery a pair of long narrow dissecting-forceps, cleanly isolating each branch for ligature before division. The method seemed ideal, but the use of the forceps appeared to me to have many disadvantages. Subsequent trial of Brunner's open wire dissector, and various modifications of Kocher's dissector, including that of the late Mr. Cecil Joll, showed that they too were not quite suitable for the purpose.

The ligature-passing end of my instrument has a blunt point which enables the hollowed-out curved end of the

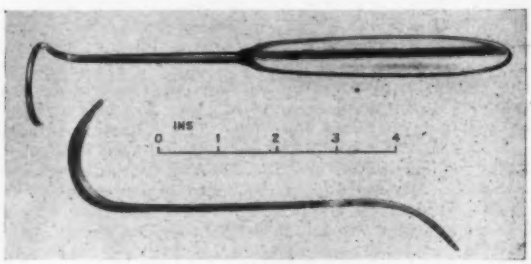


Fig. 2.

dissector to be pushed through the mesentery on either side of the vessel, so that the latter is straddled across it. This allows two ligatures to be passed with an aneurysm needle, which is curved conveniently for the purpose and, after tying, the vessel can be cut between them without any risk of damage to tissues lying deep to it. The other end of the dissector is shaped like a Macdonald's blunt dissector (fig. 1). This instrument we have found particularly useful when ligaturing vessels obscured by fibrous tissue—e.g., the left gastric artery when doing a resection for gastric ulcer. For ligature of vessels which lie deeply, the dissector and aneurysm needles have been modified as in fig. 2.

The dissector, which at King's College Hospital is known as "the boat," is now made by Messrs. Down Bros.

HAROLD C. EDWARDS
King's College Hospital, London, S.E.5 C.B.E., M.S. Lond., F.R.C.S.

# Reviews of Books

## High Blood Pressure

GEORGE WHITE PICKERING, F.R.C.P., professor of medicine, University of London. London: J. & A. Churchill. 1955. Pp. 547. 65*s*.

RECENT developments in the treatment of high blood-pressure by medical or surgical devices make the publication of this book timely, and Professor Pickering's work on hypertension during the past twenty years makes him especially qualified to write it. Its scope is comprehensive and covers the physiological, pathological, and clinical aspects of the problem; but the greater part is concerned with the causation and course of essential hypertension.

The early chapters deal with measurements of the blood-pressure and factors affecting it in health. Nine chapters describe essential hypertension with particular reference to genetic and environmental factors in its production, morbid anatomic features, and the clinical phenomena of the benign and malignant phases. A useful section on treatment deals critically with modern drug therapy and surgical measures. Hypertension due to renal and endocrine disease is considered more briefly, but in a manner both clear and practical.

Professor Pickering's main purpose is to produce a more informed concept of the nature of essential hypertension by statistical studies of population samples. He concludes that essential hypertension is quantitatively and not qualitatively different from normal blood-pressure, that this difference is inherited as a graded characteristic, and that it is determined largely by a combination of imperfectly understood environmental factors, of which those operating through the mind and the diet appear to be important. It is perhaps a little difficult to see how this thesis differs appreciably from the generally accepted concept of benign hypertension derived from the study of individual patients. It does, however, emphasise the need for close discrimination in treating high blood-pressure, and it provides a conclusive argument against the view that essential hypertension is due to organic renal disease, arterial or otherwise. Professor Pickering writes in a personal style which, though nowadays unfashionable in scientific literature, is well suited to a book written around the author's own researches. It is reassuring to note that with the accumulation of new evidence his controversial views on such topics as hypertensive encephalopathy, the mechanism of papilloedema, and the occurrence of vascular spasm are becoming less unshakable.

No-one can read this book without realising that it embodies many years of continued, careful observation, shrewd thinking, and an untiring determination to attack the problem of hypertension from every possible angle. Clinical observation, animal experiments, and the statistical method have all been used in an attempt to throw light on the genesis of this common disorder. If no final and satisfying answer has been produced, we are at least given a penetrating and imaginative assessment of the situation.

## The Physician and His Practice

Editor: JOSEPH GARLAND, M.D., Editor of the *New England Journal of Medicine*. Boston: Little, Brown. London: J. & A. Churchill. 1954. Pp. 270. 36*s*.

THIS account of medical practice in the United States has been written as a work of reference for the newly qualified man or woman who is about to enter independent practice. The chapters composing it are contributed by experienced doctors, only one of whom is described as a general practitioner, the others including professors of medicine, surgery, therapeutics, and legal medicine in different American universities. The overlapping which might be expected in a book of this nature has been largely avoided by careful editing.

For the British reader the interest of this book lies in the insight it gives into conditions of medical practice in the United States. The same needs are there; for the presentation of illness in an American community is unlikely to differ very much from that in a European community of similar type. The ways in which American medicine meets these needs are well described. The reader will judge for himself whether the patient can receive as high a standard of medical care in an environment of unrestricted financial competition; and the authors themselves, while supporting the principle, may perhaps have some misgivings in this respect.

The new entrant to medical practice in the United States will find this book a necessity. The visitor from this country will find it a valuable introduction to the American pattern of medical practice, both in general and more specialised fields.

## Diseases of the Ear, Nose and Throat in Children

T. G. WILSON, M.B., LITT.D., F.R.C.S.I., M.R.I.A., ear, nose and throat surgeon, Dr. Steevens' Hospital, Dublin. London: Heinemann Medical Books. 1955. Pp. 291. 70*s*.

THIS book is, in Mr. Wilson's words, "the first textbook to be written on diseases of the ear, nose and throat in children." Though he does not set out to be comprehensive, he dismisses some subjects perhaps too briefly—e.g., furunculosis of the ear, which is by no means uncommon in children. But his discussion of the tonsil-and-adenoid problem will probably meet with the approval of most laryngologists and many pædiatricians, and he provides considerably more information about congenital defects than is to be found in larger works.

## Methods in Enzymology

Vol. I. *Preparation and Assay of Enzymes*. Editors: SIDNEY P. COLOWICK; NATHAN O. KAPLAN, McCollum-Pratt Institute, Johns Hopkins University, Baltimore. New York and London: Academic Press. 1955. Pp. 835. $18.00.

THE title of this book implies that it was designed as a laboratory manual; but in fact it is much more. Though about five-sixths of this volume is given to detailed descriptions of methods for purifying individual enzymes, these are preceded by a valuable series of short articles on the underlying principles of a number of techniques which are the stock-in-trade of the enzymologist. Furthermore, the accounts of the individual enzymes are not mere recitations of the steps in preparative and analytical procedures (though these are fully set out) but usually include a short review of the "biochemical context" of the enzyme.

It is perhaps a pity that the adequacy of the descriptions of laboratory manœuvres does not appear to have been checked in institutions other than the author's, since this precaution often reveals the inadvertent omission of important details which have become second nature to the originator. Another questionable point is whether there is a need to recapitulate, in a book of this type, lengthy sets of technical instructions which are already available in the periodical literature. But the editors point out that enzymes are now established as analytical reagents, and the necessity to prepare one or more of them may therefore crop up, quite incidentally, in some project not primarily concerned with those particular enzymes. Hence it is convenient to have a reference book explaining how to prepare the catalyst; and the advantage is of course all the greater for workers who have no ready access to a library containing the original literature.

This first volume covers the enzymes of carbohydrate and lipid metabolism, including the tricarboxylic acid cycle, and the aim has been to include, so far as practicable, all that are known. In some cases the purification procedure is described up to the point of crystallisation; but, where this cannot be done, identifiable features of the product are mentioned, together with information on substrate-specificity, cofactor-requirements, and such characteristics. Among the introductory articles, those by A. A. Green and W. L. Hughes on protein fractionation and by R. R. Porter and C. H. W. Hirs on partition and ion-exchange chromatography respectively are particularly good. Vol. II is to deal with the enzymes of protein and nucleic-acid metabolism, together with others not included in vol. I; vol. III with the preparative and analytical chemistry of substrates, coenzymes, and products; and vol. IV with miscellaneous techniques such as those used in studies with isotopes.

*Methods in Enzymology* will be helpful to endocrinologists, bacteriologists, pathologists, and others who seek occasional guidance on problems of enzyme action. The subject-matter, as part of the still poorly systematised science of protein chemistry, must include much that is provisional or empirical; but, with this book's aid, anyone who has some basic acquaintance with biochemical enzymes should be able to prepare and assay any of the technique described—though possibly the yield may not be good at the first attempt.

### The Technique of Psychoanalysis

EDWARD GLOVER, M.D. London: Baillière, Tindall & Cox. 1955. Pp. 404. 35*s*.

Dr. Glover has made valued contributions to psychoanalytical theory, notably in his conception of the development of the integrated ego from primitive nuclei. It is, however, as a gifted expositor, a formidable controversialist, and a candid examiner of some of the weaknesses as well as the strength of present-day psychoanalysis that he occupies a foremost position among the second generation of psycho-analysts. The present work is complementary to the textbook in which he set out the basic theory of psycho-analysis and its application to the understanding of mental disorders, psychopathy, and crime.

The first part is an expanded version of the lectures which he published twenty-seven years ago. With a stronger tang of individuality and the boldness that comes with experience and independence, they now provide a more vigorous, at times more unconventional and uncompromising, guide through the labyrinth than they previously did. They illuminate many practical matters which are of daily concern to psychotherapists of every complexion. Part 2 reproduces the book which appeared in 1940 as a research supplement to the *International Journal of Psychoanalysis*. It includes the frank and startling findings that came out of a questionary on technique circulated to British psycho-analysts by Dr. Glover when he was director of research to the Institute of Psycho-analysis. Apart from minor stylistic changes, the only additions to the text are some sentences and footnotes underlining his conviction that the inbreeding which is common in the form of training-analyses within a local group leads to attachments —"a hierarchy of post-analytic transferences"—which tend to hamper free discussion and the development of new ideas. At the end of the book three characteristic articles are reproduced—one on the effects of inexact interpretation, another on therapeutic criteria, and a third on the theory of psycho-analytic treatment. These stress existing gaps and uncertainties, and point out that treatment is by no means as yet based on a large body of accepted principles. Some psycho-analysts have diametrically opposed views on mental mechanisms and content; this, Dr. Glover holds, can be accounted for only by supposing that one or other of the disputants must be practising suggestion, through inexact interpretation, in his psycho-analytic work.

By many bold admissions of this kind Dr. Glover indirectly assures the reader that he is more concerned with portraying warts and furrows, as well as symmetrical charms and happily congruous features, than has been customary among practitioners of psycho-analysis when engaged in painting its portrait.

### The Rôle of Humoral Agents in Nervous Activity

BRUNO MINZ, M.D., research professor, department of general physiology, National Centre of Scientific Research, Sorbonne, Paris. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1955. Pp. 230. 55*s*. 6*d*.

THE concept that chemical agents are essential for the transmission of nervous impulses is, in its modern form, some fifty years old, though somewhat similar but vague ideas had been put forward earlier. The subject is of great practical as well as theoretical interest, since certain diseases (such as phæochromocytoma) are caused by excess of a humoral agent, and others (such as myasthenia gravis) by the deficiency of an enzyme system, or a short chain of chemical reactions. Peripheral structures are obviously more open to investigation than central ones, and a great deal of work has been done on the neuromuscular junction and on transmission in autonomic ganglia. Of late, the central structures too have been made to yield information—not only the spinal cord but the higher centres also. From this work has come much of practical value, including tubocurarine and ganglion-blocking agents. Professor Minz is an experienced worker in this field, and his readable and stimulating book gives an interesting account of what has been discovered and of how much remains to be discovered.

The first chapter tells of the earlier work, and of how the idea has grown since T. R. Elliott, in 1905, suggested that adrenaline might be the sympathetic transmitter. The work on the autonomic nervous system stemmed from this, and from Loewi's classical observation on the "vagus Stoff" of frog's heart. The amount of work done is monumental, but, as Minz points out, the exact part played by acetylcholine and adrenaline in autonomic ganglia, and the ways in which each modifies the activity of the other, are still far from clear. The formation and destruction of acetylcholine, and the newer observations on the site in the motor end-plates where this occurs, are described. Experimental work has now reached the point where it is possible to make a tentative synthesis of the functions in neuromuscular transmission of acetylcholine, sodium, and potassium. The hypothesis is certainly not the final one, but it offers a step to further progress. The story of sympathomimetic substances, too, is unfinished and fascinating; both adrenaline and noradrenaline have important and different activities, the former clearly intervening in metabolic processes, and the latter in cardiac and vascular reactions. Exactly how the work is divided between them is still unknown, but recent experiments suggest that each can be individually released from the suprarenal glands: hence each must have its own specific rôle.

The last chapter deals with the latest and most difficult part of the subject—namely, humoral agents in the central nervous system. The study of these agents may, it is hoped, throw light on many mental processes and their disorders.

### Les arthroplasties de la hanche

JEAN DEBEYRE, professeur agrégé, Faculté de Médecine de Paris; PAUL DOLIVEUX, aide d'anatomie et chef de clinique chirurgicale, Faculté de Médecine de Paris. Paris: Editions Médicales Flammarion. 1955. Pp. 91. Fr.1700.

WE are still a long way from an arthroplasty of the hip that will endure as long as the opposite unaffected joint. This monograph is a thoughtful exposition of the problem, based on Professor Debeyre and Dr. Doliveux's experience of some 200 hip arthroplasties using acrylic-resin prostheses or vitallium cups.

They have had the same disappointments as other surgeons, the same later deterioration after early good results, and the same trouble with fractured prostheses, though the French acrylic resin seems to be stronger than ours. In osteo-arthritis, arthroplasty led to no improvement or to aggravation in nearly a quarter of the patients, results were poor in nearly half the cases of old congenital subluxation, and even worse in the high posterior congenital dislocations. They now prefer some form of cervico-capital prosthesis and have abandoned the classical Judet type.

In a useful chapter, the mechanics of the forces affecting the upper end of the femur are reduced to their simplest terms—even so, complicated enough—with special emphasis on the importance of length and inclination of the femoral neck. The analysis of the causes of the poor results is helpful, and the authors admit they are conservative in their indications for operation. As in all monographs on a rapidly developing subject, this book will soon be of no more than historical interest, but it gives a sound account of present problems and progress as seen through French eyes. The general production is pleasing, but the price is high.

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**Biological Specificity and Growth** (Princeton: University Press. London: Oxford University Press. 1955. Pp. 233. 40*s*.).—The proceedings of the symposium on this subject, held by the Society for the Study of Development and Growth and the committee on developmental biology of the National Research Council at the University of New Hampshire in 1953, have now been published under the editorship of Elmer G. Butler.

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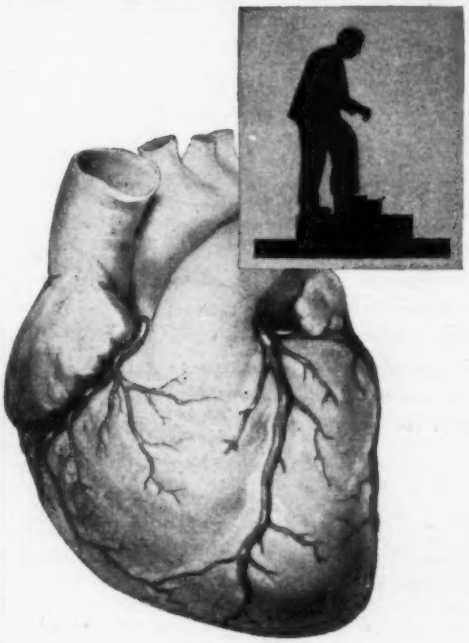

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# THE LANCET

*LONDON: SATURDAY, OCT. 22, 1955*


## An Incomplete Victory

BETWEEN 1948 and 1954 the annual number of deaths from respiratory tuberculosis in England and Wales declined from 19,088 to 7069, and notifications from 43,971 to 38,303—a drop of 63% and 13%. While confirming that the disease is on the wane, these figures indicate that the battle for control is by no means over; mortality has declined rapidly but morbidity is still high. Nor is the picture one of uniform improvement throughout the country; for as a committee of the Joint Tuberculosis Council points out,[1] "National experience interpreted statistically is an average of urban and rural experience and there is a wide scatter of observations from the mean." (For instance, in London and in Devon the notification-rate, in clear contrast to that in most other areas, has been steadily falling for a decade or more.) The report rightly emphasises that if national trends are to be interpreted correctly, local statistics must be analysed in detail. A comparison of what is happening in town and country, city and suburb, new estate and slum, particularly with regard to the annual number of notifications for each sex in the different age-groups, would be both instructive and rewarding.

The difference in rate of decline between mortality and morbidity is undoubtedly due largely to better treatment and intensification of diagnostic effort; but it would be unwise to accept the fact that tuberculosis is often diagnosed earlier and more precisely than ten years ago as a complete explanation of the still relatively high level of notifications. The J.T.C. report implicates a number of factors.

"(*a*) The increasing frequency of primary infection in young adults, the increasing risk of infection arising from industrialisation, the increasing number of surviving infectious persons, the rising percentage of elderly tuberculous persons, variation in environmental standards; (*b*) Intensification of case-finding efforts, variability in standards of notification, immigration of susceptible persons."

These observations suggest that prevention lags behind treatment. We have in fact been so long on the defensive that we are failing to recognise that the time for attack is upon us. The preventive approach is sometimes hampered by the division of command which deputes diagnosis to one authority and prevention to another; local initiative accounts for commendable sallies here and there, but there is insufficient coördination in the expanding field of epidemiology. Prevention is inseparably linked with epidemiology, but a multitude of local authorities acting individually are unlikely to provide epidemiological material for the strategic planning of a national or even a regional campaign. Again, we have not yet agreed on the best method of tuberculin testing, so this, one of our chief epidemiological weapons, is not used to full advantage; and we are still in doubt regarding the rôle of B.C.G. The inquiry by the British Tuberculosis Association's research committee into methods of tuberculin testing, and the Medical Research Council's investigation on B.C.G., will doubtless provide much-needed help; but meanwhile indecision prevails.

Finally, we deceive ourselves if we assume that improved methods of diagnosis and treatment will necessarily bring about a rapid fall in mordibity. Fresh infections continue to arise mainly from the undetected sputum-positive patient, who presents a continuing problem; while in the two-thirds of the adult population who already harbour the tubercle bacillus breakdowns due to stresses of various kinds cannot be expected to cease. Here such factors as the large amount of overtime that is being worked and the increasing practice of the wife going out to supplement the family income may take their toll. Such social factors are not dispelled by detecting tuberculosis earlier or by treating it more effectively. In reorganising our forces to deal with the new phase of attack on tuberculosis we should bear in mind that this subtle and stubborn foe is still a disease with strong social implications.

1. The Changing Character of Tuberculosis: Report by a Committee of the Joint Tuberculosis Council, 1955. Copies obtainable from Dr. R. L. Midgley, Hawkmoor Chest Hospital, Bovey Tracey, Devon. Pp. 28.

## Treatment of Cushing's Syndrome

WHATEVER the true source of Cushing's syndrome (perhaps it usually originates from the anterior pituitary, as CUSHING himself thought, or from the hypothalamus [1]), we now know that the manifestations—the round congested face, the peculiar obesity of the trunk, the acne, hairiness, and purple striæ of the thin, bruisable skin, the mental changes, the sexual depression, the osteoporosis, the raised levels of blood-pressure, blood-sugar, and blood-count—are associated with an overflow of corticosteroids from an adrenal cortex swollen either on both sides by diffuse hyperplasia, or, more rarely, on one side by a benign or malignant tumour.

The brilliant modern cures of this disfiguring and lethal disease are not achieved without some diagnostic pains. Though Cushing's syndrome is three or four times commoner in women than in men, the diagnosis will be warranted in only a very few of the many women afflicted by obesity, hirsutism, and menstrual disturbances.[2] In the established case every care must be taken to exclude an adrenal cortical tumour. The "cortisone test" [3] is based on the hypothesis that in cases of bilateral adrenal hyperplasia cortisone will produce a fall in 17-ketosteroid excretions (presumably by inhibiting pituitary corticotrophin), but that in cases of tumour it will not (suggesting the tumour's independence of pituitary control). Radiographically the adrenals may be outlined by perirenal or presacral insufflation of air or oxygen, though well-taken plain films may give as much information.[4] At surgical exploration, an atrophic adrenal on one side will point to a tumour on the other.[2]

It is agreed that adrenal tumours should be resected whenever possible, but there are two different lines of approach to the treatment of Cushing's syndrome associated with bilateral adrenal hyperplasia: either the pituitary is attacked by surgery or radiotherapy, to suppress its corticotrophic stimulus, or enough of

1. Heinbecker, P. *Medicine*, 1944, **23**, 225.
2. Sprague, R. G. *Proc. R. Soc. Med.* 1953, **46**, 1070.
3. Jailer, J. W., Gold, J. J., Wallace, E. Z. *Amer. J. Med.* 1954, **16**, 340.
4. Cope, O., Raker, J. W. *New Engl. J. Med.* 1955, **253**, 119, 165.

the adrenal cortex is removed to induce remission of the disease. Electrocoagulation of the hypophysis has been advocated in Sweden,[5] but the value of this measure has not yet been established. There have been many conflicting opinions about the efficacy of pituitary irradiation. Thus BISHOP and his associates [6] had little success with this method alone, but think it logical to follow adrenal surgery by radiotherapy; whereas SKRIMSHIRE,[7] who obtained by radiotherapy remissions in 4 out of 6 cases, suggests that this should be the first therapeutic choice and that operation on the adrenal should be reserved for the failures. American opinion, backed by a considerable weight of evidence, has come down heavily in favour of adrenalectomy as the most effective therapy. SPRAGUE [2] and his colleagues at the Mayo Clinic operated on 58 cases of Cushing's syndrome due to bilateral adrenal hyperplasia, usually removing 85–90% of one gland and the whole of the other; there were 46 cures, 1 failure, 7 postoperative deaths (5 before the introduction of cortisone) and 4 later deaths. In an authoritative report from Harvard, COPE and RAKER [4] review 46 cases studied in the past nineteen years. They were disappointed in pituitary irradiation, which gave remissions in only 1 out of 17 cases. Their patients treated by operation on the adrenal included 5 with malignant tumours, all of whom died; 11 with benign tumours, 10 of whom are alive and cured; and 25 with hyperplasia. Of these 25 with hyperplasia 7 were operated on before the cortisone era, when only 30% of the total adrenal tissue was resected; 2 died, 2 had incomplete remissions, and 3 are well. In the other 18 cases the average estimated resection was 89%; 2 died, 1 was lost to follow-up, and 15 are cured, only 5 of these now requiring cortisone. COPE and RAKER give 100 mg. cortisone intramuscularly twelve hours before operation and again before the anæsthetic, but indicate that intravenous hydrocortisone may be used during future operations. They prefer an extrapleural transdiaphragmatic approach, and, for hyperplasia, subtotal resection since total resection entails complete dependence on substitution therapy. They remove 90–95% of each adrenal, usually in two stages. Postoperatively, no supplementary cortisone is necessary after the first stage, but after the second operation (and after removal of a tumour) 300 mg. cortisone is given daily until the postoperative course is smooth. The dose is then reduced gradually to some 50 mg. daily by the tenth to fourteenth day. Patients must be kept under the closest observation when attempts are made to reduce the cortisone still further, or to stop it, during the ensuing weeks, because such curtailment is liable to be complicated by a peculiar stormy reaction whose manifestations include weakness, anxiety, dermatitis, anorexia, nausea, abdominal pain, vomiting, muscle and joint pains, fever, lymphocytosis, and hypercalcæmia, without the characteristic diarrhœa, hypotension, and cramps of the typical addisonian crisis. This illness may be lengthy and even fatal, but it has been found to respond promptly when adequate doses of cortisone are resumed.[2 4 8] COPE and RAKER consider that these patients pass very quickly into positive cellular balance after adrenalectomy, and that the stormy reactions are related to rapid regrowth of tissues and consequent nutritional needs.

The way is now open to further advances in the management of Cushing's syndrome. Meanwhile workers in this field are to be congratulated on the remarkable progress which they have made in so short a time.

5. Arner, B., Luft, R., Olivecrona, H., Sjögren, B. *J. clin. Endocrin.* 1953, **13**, 1101.
6. Bishop, P. M. F., Glover, F. N., de Mowbray, R. R., Thorne, M. G. *Lancet*, 1954, ii, 1137.
7. Skrimshire, J. F. P. *Ibid*, 1955, i, 270.
8. Beck, R. N., Montgomery, D. A. D., Welbourn, R. B. *Ibid*, 1954, ii, 1140.

## "Displaced Persons"

IN the long-stay wards of most of our mental hospitals may be found a mixed group of patients from the European mainland. Most of them are men, and in many the schizophrenic process is reinforced by social isolation. Even more than the English chronic patient, they give the impression of having abandoned the attempt to communicate with their environment. Their companions do not speak their language, and the staff understand their mental processes less than they understand those of the English patients. Deplorable in itself, the plight of these immigrant patients has a wider significance in that it is only an acute form of the plight of thousands of other people who have been uprooted by the second world war. The difficulties these people encounter in facing new ways of life and a new cultural environment are discussed in a report [1] to UNESCO drawn up by thirteen doctors and psychologists, at least two of whom have themselves experienced persecution, terror, and uprooting. The striking photographs which accompany the report show an empty, hopeless expression on the faces of the men, women, and children—an emptiness following much suffering in concentration camps and later in camps for displaced persons.

One of the biggest difficulties the immigrant has to face is the hostility of the people in his new surroundings. Even where this does not show itself in overt behaviour, there are often undercurrents running counter to the avowed intentions of sympathetic people who wish to help him to settle down. Admittedly this hostility is not exclusively psychological: for instance, the British miners' opposition to the proposed employment of Italians in the pits could be explained on grounds of economics and the vagaries of the labour market. But this kind of unfortunate situation arises wherever men are sent to begin a new life; and if the reactions of the newcomer require modification so also do those of the native population, with their fear of being "displaced by the arrival of the displaced." The need to combat differences and emphasise our brotherhood in a common predicament was never more urgent than at this time when the tendency towards some sort of world federation races tortoise-like with the hare of atomic-weapon development. Mankind has long been told that "all men are brothers," and we have now only a short time in which to accept and act upon this belief. The surges and cross-currents produced in a community by the arrival of displaced people reflect this wider contemporary need.

A difficult situation is often made more difficult by the confusion of tongues. The brighter of the newcomers quickly gain a working knowledge of the new language, but their alien intonation remains a

1. Flight and Resettlement. H.M. Stationery Office. 1955. Pp. 231. 19*s.* 6*d.*

prominent sign of "difference." The displaced person can soon succeed in melting into the crowd and looking like one of the local population. But when he speaks, there is usually a reaction within the group—a kind of reappraisal. Perhaps there is a subtle and barely conscious attempt to "make allowances" for the foreigner; which gives rise to an equally subtle counter-reaction—a feeling of being excluded and of hopelessness of ever really "belonging." This may be an over-refined observation, but it is part of the "we—they" reaction which tends to displace the sense of common humanity and brotherhood even in the best-intentioned. The effect is sometimes aggravated by the "depressive-manic" tendency in some of the younger displaced persons who have overcome their depressive apathy only to acquire euphoric attitudes, sometimes verging on the aggressively bumptious, which jar on the indigenous population. For a displaced person who is mentally ill things are of course even worse. Bewildered and already lost in the complex labyrinth of a psychosis, he can make nothing of the attempts of doctors and nurses to communicate with him. His smattering of English, if any, remains a smattering. Thus when the Polish medical units in this country were broken up and the patients distributed among our mental hospitals, the arrival of a considerable number of patients with severe psychotic disabilities, and little knowledge of any language save Polish, created grave difficulties which have not been overcome.

As a nation we are not without experience of immigrants, Through the centuries we have successfully, and with benefit, absorbed invaders and refugees from all over Europe. But what was once a problem for individual nations has now become a common global challenge; and we ought to be sure that we take our full share in helping the uprooted, whose misfortunes cut across national boundaries and encircle the world.

# Annotations

## THE HARLOW EXPERIMENT

AFTER the late war many interested in general practice hoped that experience of the first experimental health centres would be followed by the construction of such centres throughout the country. In this way, it seemed, the stultifying isolation of many practitioners might be ended, and a better service offered. These hopes are now dimmed; for it has become clear that serious obstacles stand in the way of establishing centres in areas where practices are already in being; and the high cost of some of the experimental centres, built (perhaps rightly) as models of the best, may have daunted local authorities, who would bear the brunt of the cost. Accordingly attention has been largely transferred to the promotion of group practice. Yet health centres are still likely to be useful and welcome in new towns, growing suburbs, and rebuilt urban areas; and that the initial cost need not be prohibitive has been shown at Harlow. Here, owing to the initiative and generosity of the Nuffield Provincial Hospitals Trust, three centres have already been finished; and last Monday these were officially opened by Lord Nuffield.

These three centres form part of a £260,000 scheme by the Trust to provide a comprehensive service for the eventual population of 80,000. This scheme is especially interesting and important because under it the family-doctor service is to be integrated with an industrial health service (in addition to three further health centres of the type already built, two industrial health centres are planned), and because a central specialised centre is to be set up near the site of the proposed Harlow Hospital. This will house (in addition to general practitioners) special local-authority clinics for orthopædics, ophthalmology, speech-therapy, and child-guidance; and perhaps investigation units provided by the regional hospital board. Hitherto there has been some doubt whether a pathology laboratory and X-ray department should be included in health centres; it has been suggested that an X-ray department might be "uneconomic," and that supervision of technicians in charge of either department might not be easy. Hitherto there has been no opportunity to test the worth of a central laboratory and X-ray department serving a group of centres. At Harlow the opportunity has arisen; and we hope it will be seized. We need to know whether such a service would notably aid practitioners and their patients, and whether it would also notably relieve the burden of hospital departments which now offer "open access," even if they had to second a technician whole-time and a consultant part-time to the centre. At Harlow, whatever the result these two units at the centre could be transferred, if desired, to the hospital when it is completed.

The centres at Harlow are not "health centres" according to the terms of the National Health Service Act, since dental surgeons may practise privately there. Nevertheless the lessons that are now being learnt at Harlow will be of inestimable value to those planning centres proper under the Act. On p. 863 of this issue Dr. Stephen Taylor and his colleagues describe some of these lessons in a lively account which is perhaps especially valuable for the light it throws on the need for good human relations and the ways in which these have been established.

## DECOMPRESSION IN BELL'S PALSY

THE term Bell's palsy is now generally reserved for facial palsy of peripheral type and of sudden onset, whose ætiology is obscure. (Sir Charles Bell originally described a series of cases of diverse origin, including local sepsis.) Histological material is hard to come by. In about 80% of cases there is never any clinical or electrical evidence of nerve degeneration, the disorder remaining a neurapraxia; and in these histological change would not be expected. Even in cases where denervation occurs, the disease is never fatal and the cause has usually to be surmised from clinical and electrical evidence. From such evidence it is now fairly widely accepted that the primary palsy is due to some local factor, such as ischæmia of the nerve-sheath or more rarely a virus infection (e.g., herpes zoster), and that consequent œdema, in some cases causes secondary compression of the nerve in the confines of the facial canal. If this view is correct, then decompression of the nerve might help if undertaken promptly, before swelling has led to more extensive neural damage such as axonotmesis. But the problem is how to select the right cases at this stage. Once there is evidence of denervation, most of the damage has been done; but, if this evidence is found early, immediate decompression might prevent further damage, and in particular avert the very rare permanent palsies or the severe associated spasm and mass movements which seem to be due to severe neuronal damage. Taverner [1] points out that electromyography will provide clear evidence of denervation, and he has found this as early as the fourth day after the onset of palsy. Taverner himself considers that decompression is never indicated, since the gradations of recovery and variations of

1. Taverner, D. *Brain*, 1955, 78, 209.

associated movement after Bell's palsy cannot be explained by compression. This reasoning may not be generally accepted; but in any event the place for decompression will be small, since even denervation, when it does occur, is rarely so substantial as to cause disabling spasm or associated movement.

Thus, unless we are to submit many to unnecessary operation, we need a method of identifying cases in which denervation is going to be severe. Improvements in the technique of electromyography may provide such a method; but meanwhile most patients will be content to let the condition take its natural course. In the very occasional case where palsy is apparently permanent and some mechanical blockage to regeneration seems possible, exploration may be useful; but in this group it can be logically undertaken only after any chance of recovery by regeneration has been excluded by the passage of months without improvement.

## VANISHING LUNGS

RADIOGRAPHY sometimes reveals the development, in the course of pulmonary tuberculosis, of cyst-like spaces in areas where the disease is regressing; and this feature has been observed much more commonly since the introduction of effective chemotherapy. Rappaport [1] discusses it under the piquant title "vanishing lungs." Some of these spaces are no doubt thin-walled cavities, but the consensus of opinion seems to be that most are emphysematous bullæ caused by a check-valve mechanism set up by partial bronchial obstruction. This mechanism can sometimes be convincingly demonstrated at operation for the removal of large bullous cysts of lung,[2] and it is almost certainly responsible for the cyst-like lesions which so commonly come and go in the course of staphylococcal pneumonia in children. Sometimes an emphysematous tension-cyst may reach such large dimensions that there appears to be nothing but air in the hemithorax; but the lung has not really "vanished"—it is merely compressed by the cyst—and the thoracic surgeon can conjure it back again by removing the cyst and thus enabling the sound lung tissue to re-expand. If the air-spaces which develop in tuberculous lungs after treatment are tension-cysts of this sort, the term "vanishing lung" is misleading; but Rappaport suggests that in some instances, perhaps the majority, it is truly descriptive. He points out that exudative tuberculous lesions may occasionally undergo spontaneous healing by actual resolution rather than by fibrosis [3]; and that this process is common and much more complete when antituberculous drugs, especially isoniazid, are given—a view which appears to be amply confirmed by Dick's [4] pathological studies. Rappaport submits that there is every reason to suppose that as they clear away debris caused by the disease scavenger cells will likewise remove alveolar septa damaged by toxins, so that air-spaces will appear which may increase in size owing to normal lung traction or to secondary obstructive hyperinflation.

Whatever the nature of these air-spaces, how to deal with them is an important current problem. Some take the view that since an emphysematous bulla cannot be distinguished from a thin-walled cavity the lesion should be regarded as a cavity and collapsed or resected. Others argue that since "open" healing of a cavity may follow chemotherapy (that is to say, the cavity may become lined with epithelium derived from the bronchus of supply or be left with a clean fibrous lining) the lesions should be looked on as innocent unless tubercle bacilli are recovered from the respiratory secretions. Rappaport advocates resection because he believes that, even if there is no recrudescence of lurking tuberculous foci, the emphysema, once started, is likely to extend. On the other hand, a growing number of physicians are so impressed with the results of long-term chemotherapy in pulmonary tuberculosis that they are reluctant to consider surgery until there is clear evidence that conservative treatment has failed.

1. Rappaport, I. *J. Amer. med. Ass.* 1955, **158**, 1436.
2. Allison, P. R. *Thorax*, 1947, **2**, 169.
3. Pinner, M. Pulmonary Tuberculosis in the Adult. Springfield, Ill., 1945; p. 39.
4. Dick, J. C. *Lancet*, July 30, 1955, p. 216.

## TRAUMA AND ADRENAL HÆMORRHAGE

SINCE Roux and Yersin [1] described "hæmorrhagic congestion" of the guineapig's adrenals in diphtheria, adrenal hæmorrhage has usually been ascribed to a toxic-infectious process; the clearest example is the Waterhouse-Friderichsen syndrome, due to meningococcal infection. Adrenal hæmorrhage has been found in association with many different disorders, ranging from acute alcoholic poisoning [2] to ulcerative colitis treated with corticotrophin [3]; but accounts of it are still so few as to warrant detailed reports of individual cases.[4] A macroscopic diagnosis of adrenal hæmorrhage is not always borne out by detailed histological examination.[5] The series of 17 cases of post-traumatic adrenal apoplexy reported by Sevitt [6] is therefore of great clinical interest.

Sevitt found these 17 cases in 60 necropsies of patients who had met with various accidents. The hæmorrhage was bilateral in 5, and unilateral (mostly on the right side) in 12; and in some cases hæmorrhage into the adrenal was associated with hæmorrhage or bruising of the periadrenal tissues. Histologically central hæmorrhage had destroyed the medullary tissue; necrosis of the cortical tissue, probably the result of ischæmia, was also seen. Thrombosis of the adrenal veins, described by several workers,[7–9] was found in only 1 case; but small tears, fissures, or ruptures of the walls of the venules were present in 12 out of 17 hæmorrhagic glands. Sevitt suggests that these result from temporary compression of the gland.

Traumatic hæmorrhage of the adrenals might be judged to be uncommon from the scanty references to it in published work, particularly if, as Gruenwald [5] insists, the not uncommon adrenal hæmorrhage of the newborn is no longer to be ascribed to trauma. Some textbooks of pathology [10 11] do not mention adrenal hæmorrhage at all. Martland [12] merely states that massive hæmorrhage into one or both glands can be seen after blunt-force compression injuries to the abdomen or lower part of the chest. Adrenal hæmorrhage might be expected to be fairly common in air-raid casualties; but, although this lesion has occasionally been found in laboratory animals exposed to blast and in an air-raid victim,[13] recent accounts of observations in the 1939–45 war [14 15] do not mention the lesion; nor has adrenal hæmorrhage been seen in the victims of the recent Comet disasters.[16] It would therefore seem that such hæmorrhage is produced by trauma of a particular type (presumably rather localised), leading to rupture of medullary vessels; the high proportion of unilateral adrenal lesions associated with ipsilateral injuries to the chest or abdomen in

1. Roux, E., Yersin, A. *Ann. Inst. Pasteur*, 1888, **2**, 629.
2. Santo, E. *Frankfurt. Z. Path.* 1941, **55**, 115.
3. Wilson, D. A., Roth, D. *J. Amer. med. Ass.* 1953, **152**, 230.
4. Mackenzie, D. H. *J. Path. Bact.* 1955, **69**, 333.
5. Gruenwald, P. *Arch. Path.* (*Lab. Med.*), 1955, **60**, 150.
6. Sevitt, S. *J. clin. Path.* 1955, **8**, 185.
7. Snelling, Ch. E., Erb, I. H. *J. Pediat.* 1935, **6**, 22.
8. Hall, E. M., Hemken, L. *Arch. intern. Med.* 1936, **58**, 448.
9. Keele, D. V. K., Keele, K. D. K. *Brit. med. J.* 1942, ii, 687.
10. Anderson, W. A. Pathology. London, 1953.
11. Moritz, A. R. Pathology of Trauma. London, 1954.
12. Martland, H. S. *Arch. Path.* (*Lab. Med.*), 1944, **37**, 147.
13. Zuckerman, S. *Proc. R. Soc. Med.* 1941, **34**, 171.
14. Benzinger, Th. *In* German Aviation Medicine, World War II: vol. 2. Department of U.S. Air Force, Washington.
15. Schubert, W. *Virchows Arch.* 1952, **321**, 295.
16. Armstrong, J. A., Fryer, D. J., Stewart, W. K., Whittingham, H. *Lancet*, 1955, i, 1135.

Sevitt's series bears this out. Traffic accidents figure prominently in Sevitt's list of causes; and the single instance reported by Snelling and Erb [7] was in a child killed in a motor-car accident.

Sevitt [6] points out that the other injuries sustained by the casualties in his series were severe enough to account for death, but in at least 2 cases there may have been an element of adrenocortical failure as well (these 2 patients were the oldest in his series). Histological evidence of adrenocortical overactivity was found in other cases; but, as Martland [12] has pointed out, extensive hæmorrhage in the central portions of the adrenal gland may obstruct the blood-flow; so it is conceivable that despite such evidence of adrenocortical overactivity there may be signs of a peripheral deficiency of adrenocortical steroids. It would be well to keep in mind this possibility of mechanical obstruction of adrenal blood-flow, with, sometimes, direct or reflex inhibition of adrenocortical secretion, in deciding whether a suspected case of adrenal injury should be treated with corticotrophin or with adrenocortical steroids. Now that Sevitt has shown that traumatic adrenal hæmorrhage is not uncommon, it should be possible to save at least an occasional patient in whom untreated adrenocortical failure would otherwise hasten or determine a fatal outcome.

## SMOKING AND THE HEART

THE effects of smoking on the heart and circulation have excited interest for many years. Nicotine, by stimulating sympathetic ganglia, causes a rise in systolic and diastolic blood-pressures, an increase in pulse-rate, cutaneous vasoconstriction,[17] and occasionally ectopic contractions. Dizziness, nausea, and vomiting are not infrequent in susceptible or unhabituated people. The action of smoking on the coronary circulation is still uncertain. It is known that nicotine stimulates the hypothalamic-pituitary axis, causing release of vasopressin,[18] which causes constriction of the coronary arteries certainly in animals [19] and probably in man.[20] In this way smoking might cause a reduction in coronary blood-flow.[21] There is no direct evidence that nicotine or smoking has this effect in man, although the rare association of ischæmic cardiac pain with smoking (sometimes termed "tobacco angina") has often led to the assumption that nicotine can aggravate coronary-artery disease or produce temporary ischæmia. Ralli and Oppenheimer [22] mentioned 6 patients with angina pectoris in whom attacks of pain could be induced by smoking, and relieved by nitroglycerin but not by a placebo. Pickering and Sanderson [23] described 3 patients in whom smoking produced anginal pain, but only after the threshold for pain had been reduced by previous exercise and if the pulse-rate rose sufficiently. They concluded that smoking was a minor factor in the production of anginal pain, and that its effect could be explained by its action in increasing the work of the heart. Graybiel et al.[24] noted changes in the T wave of the electrocardiogram after smoking, which they attributed to the action of nicotine on the cardiac ganglia. The changes were similar to those after the administration of atropine, and significant tachycardia occurred in most of their cases. Although they do not mention the point, depression of the ST segment and flattening of the T wave may be simply a result of tachycardia, and it might be argued that smoking merely induced an increase in heart-rate without any specific action on cardiac ganglia or myocardium.

The effect of smoking on the ballistocardiogram as well as the electrocardiogram [25–27] has now been studied. Russek et al.[26] found a significant increase in heart-rate and blood-pressure after smoking both in healthy people and in patients with coronary-artery disease; decrease of amplitude of the T waves of the electrocardiogram and ballistocardiographic abnormalities were also noted. Of 37 patients with coronary-artery disease 18 had abnormal ballistocardiograms, with only slight concomitant electrocardiographic changes. Whisky improved the ballistic abnormalities induced by smoking. These workers also considered that susceptible people might, as a result of smoking, have a functional circulatory derangement (independent of previous heart-disease) consisting of dull precordial discomfort, dizziness, tachycardia, ectopic beats, and dyspnœa. Cessation of smoking caused all symptoms and cardiographic abnormalities to disappear. Russek et al. do not believe that smoking constitutes a real danger to the patient with coronary-artery disease. Buff,[27] by contrast, believes that the patient with an abnormal ballistogram after smoking should discontinue the habit; and in the U.S.A. the majority view seems to be that smoking can damage the myocardium.[28] The possible effects of tobacco on the progression of atherosclerotic heart-disease are also important. Hammond and Horn [29] conducted an extensive investigation into the death-rate attributable to coronary-artery disease and found that this was significantly higher in cigarette smokers. These disquieting results call for further investigation, although there is no direct evidence that smoking increases coronary atherosclerosis.

It is open to question whether the patient with coronary-artery disease who smokes moderately should be denied tobacco entirely. Much of the recent work suggesting that smoking is injurious to the heart depends on ballistocardiographic changes, the exact significance of which have yet to be evaluated since it is undecided whether they are produced by a disturbance of the general circulation or of the heart.[26] The effect of smoking in raising blood-pressure and pulse-rate should not be neglected, but in the habituated smoker these effects may not be great. If smoking is permitted, certain points should be remembered. Heavy smoking, chain smoking, and strong tobacco should be proscribed. Ten to fifteen cigarettes, or two to three pipes, per day should be the maximum; and smoking should not be indulged in just before, during, or after effort. Patients who have additional peripheral vascular disease should be more rigidly restricted, since there is no doubt that nicotine can cause peripheral vasoconstriction; and of course smoking should be completely prohibited in patients with thrombo-angiitis obliterans. It is doubtful whether smoking can produce true anginal pain in the absence of other associated precipitating factors [23]; but, as Russek et al.[26] point out, it may occasionally produce symptoms and cardiographic signs which simulate heart-disease in patients who are peculiarly susceptible to nicotine. The observation that alcohol reverses some of the ballistographic changes produced by smoking requires further study. At all events, alcohol in small amounts, especially at night, is of value to the patient with coronary-artery disease, by producing peripheral vasodilatation and increasing the sense of well-being and diminishing anxiety. While some physicians will believe that smoking should be prohibited

17. Goodman, L. G., Gilman, A. Pharmacological Basis of Therapeutics. New York, 1955; p. 626.
18. Burn, J. H., Truelove, L. H., Burn, I. *Brit. med. J.* 1945, i, 403.
19. Bülbring, E., Burn, J. H., Walker, J. M. *Quart. J. Med.* 1949, **18**, 73.
20. Ruskin, A. *Amer. Heart J.* 1947, **34**, 569.
21. Davis, F. W. jun., Scarborough, W. R., Mason, R. E., Singewald, M. L., Baker, B. M. jun. *Ibid*, 1953, **46**, 529.
22. Ralli, E. P., Oppenheimer, B. S. *Proc. Soc. exp. Biol., N.Y.* 1928, **26**, 9.
23. Pickering, G. W., Sanderson, P. H. *Clin. Sci.* 1945, **5**, 275.
24. Graybiel, A., Starr, R. S., White, P. D. *Amer. Heart J.* 1938, **15**, 89.
25. Levy, R. L., Mathers, J. A. L., Mueller, A. A., Nickerson, J. L. *J. Amer. med. Ass.* 1947, **135**, 417.
26. Russek, H. I., Zohman, B. L., Dorset, V. J. *Ibid*, 1955, **157**, 563.
27. Buff, I. E. *Ibid*, p. 569.
28. Editorial, *Ibid*, p. 596.
29. Hammond, E. C., Horn, D. *Ibid*, 1954, **155**, 1316.

entirely in patients with coronary-artery disease, many may feel that the evidence does not warrant forbidding this habit, which may afford solace to someone harassed by the burden of a serious disease.

## AN INDUSTRIAL HAZARD

IN this country forty industrial diseases are prescribed under the National Insurance (Industrial Injuries) Act, 1948, which entitles sufferers to special benefits. From time to time new industrial hazards are discovered, and one of the most recent of these discoveries is a disease resulting from inhalation of small amounts of cadmium-oxide dust or fume. Much interest has been shown in the question whether this disorder should be added to the list of prescribed diseases.[1] Chronic cadmium poisoning has been a notifiable and compensatable occupational disease in Sweden and Eastern Germany since 1950.[2]

In 1948 Friberg[3] studied workers exposed to cadmium-oxide dust while making alkaline storage batteries in Sweden. He found an unusually high incidence of emphysema in these workers, the majority of whom were excreting in the urine a protein of low molecular weight. Similar findings are now reported by Bonnell,[4] who has examined men exposed to cadmium fume in two English factories where alloys of copper and cadmium are manufactured for use in the electrical and associated industries. The health of 100 of these men was compared with that of similar groups who worked in the same factories but had never been exposed to cadmium. In these control groups no significant abnormalities were found. Of those exposed to cadmium 19 showed evidence of poisoning. All 19 had been exposed to cadmium for over five years. In 1 man symptoms had developed ten years after his last exposure, and his urine still contained cadmium. 9 had emphysema and proteinuria, 3 had emphysema only, and 7 had proteinuria only. 4 other men (2 with proteinuria) who were too ill to work at the time of the survey were investigated in hospital. Of these men 1, who died later, had chronic renal failure with a blood-urea of 454 mg. per 100 ml. There was no hypertension. This patient was observed for eighteen months before death, and repeated tests showed that the only protein present in the urine was "cadmium protein," which does not give the reactions of the protein commonly found in renal disease or of Bence-Jones protein. Histological examination of the kidneys showed changes indistinguishable from those of chronic nephritis.

The results of this investigation suggest that the emphysema in affected workers differs from the chronic hypertrophic emphysema associated with chronic bronchitis or bronchial asthma. In "cadmium emphysema" breathlessness develops slowly and insidiously without the cough and attacks of bronchitis which so often precede and accompany the common form of emphysema. But occasionally breathlessness may develop suddenly after an isolated acute infection of the upper respiratory tract; and chronic bronchitis may follow in these patients, though almost invariably shortness of breath comes first. There are also differences from the common emphysema in the respiratory function tests; and at necropsy in one case Lane and Campbell[5] found fundamental pathological differences. No emphysematous bullæ were seen at the periphery of the lungs, and there was a narrow zone of normal lung tissue under the pleura; and chronic bronchitis was neither widespread nor severe.

When the boiling test is applied to urine containing "cadmium protein" the result is sometimes positive and sometimes negative or inconclusive. Non-specific protein precipitants, such as 25% trichloracetic acid, give positive reactions when the boiling test is negative or doubtful. The physicochemical properties of the protein were examined by Kekwick.[6] The electrophoretic pattern showed many ill-defined components covering a mobility range similar to those of serum-proteins. Despite this the protein sedimented in the ultracentrifuge as a single component, corresponding to a molecular weight in the range 20,000–30,000, which is very much lower than that of any known serum-protein. These findings confirm the earlier work of Friberg.

King[7] found that, in the two factories surveyed by Bonnell, despite safety measures the concentration of cadmium fume in the workshop air exceeded the accepted maximum safe limit for short periods each day. But this does not mean that cadmium poisoning will necessarily develop in men exposed to these concentrations, since all the affected men had previously worked under war conditions without any precautions and so had been exposed to even greater concentrations of cadmium fume.

The insidious onset and the severe disability caused by this disease emphasises the importance of early recognition of signs or symptoms of poisoning, and of taking precautions to safeguard the health of workers exposed to cadmium-oxide dust or fume.

## A COMMON CAUSE OF DEATH UNDER ANÆSTHESIA

DESPITE the remarkable advances in anæsthetics there is still a melancholy toll of preventable deaths directly due to anæsthesia. Anæsthetists themselves are well aware of this state of affairs, and to clarify the problem a scheme was initiated for the voluntary supply of particulars of such deaths to a central collecting-point. Already three important reports[8–10] based on these returns have been published. One of them in particular indicates that inhalation of vomit is an especially common cause of death[10]—it proved in fact to be the commonest cause of death directly due to anæsthesia.

The prevention of this particular form of accident depends not only on careful preoperative preparation and the skilful administration of anæsthesia, but also on an unremitting vigil over the patient from the moment he leaves the anæsthetist to the moment when he is fully conscious and can look after himself. Those who look after him during this period must be taught most emphatically that he must never be left for a moment. If he vomits, gravity should be brought to his aid: he should be positioned so that his head is lower than his body and the vomit allowed to run out on to the floor. Attention has been repeatedly drawn to the importance of the sucker in preventing inhalation of vomit,[11] but even now in many hospitals suction apparatus is not ready at the bedside of patients recovering from general anæsthesia. The dire results are illustrated in the report of yet one more fatal case.[12] Here the patient was recovering from "a successful operation." She was placed in a ward "almost in darkness" and was visited every five minutes by the nurse in charge. During one of her absences the patient vomited and when next seen was in a state of asphyxia. A sucker was not available for fifteen minutes.

An increasing number of hospitals alive to this sort of emergency are having piped suction installed. In the long run this is cheaper than individual suction units; and the money invested will pay handsome dividends in lives saved.

1. See *Lancet*, 1955, i, 453, 506, 1019.
2. Baader, E. W. *Disch. med. Wschr.* 1951, **76**, 484.
3. Friberg, L. *J. industr. Hyg.* 1948, **30**, 32.
4. Bonnell, J. A. *Brit. J. industr. Med.* 1955, **12**, 181.
5. Lane, R. E., Campbell, A. C. P. *Ibid*, 1954, **11**, 118.
6. Kekwick, R. A. *Ibid*, 1955, **12**, 196.
7. King, E. *Ibid*, p. 198.
8. *Anæsthesia*, 1955, **10**, 218.
9. Morton, H. J. V., Wylie, W. D. *Ibid*, 1951, **6**, 190.
10. *Ibid*, 1952, **7**, 200.
11. Mushin, W. W. *Brit. med. J.* 1955, i, 1116.
12. *Manchester Daily Dispatch*, Sept. 29, 1955.

## Special Articles

# THE HEALTH CENTRES OF HARLOW

## AN ESSAY IN COÖPERATION

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As a result of the generosity and vision of the Nuffield Provincial Hospitals Trust, the new town of Harlow in Essex now has three health centres in daily use. In due course the Trust proposes to build three more health centres for general practitioners, medical and dental, and for the local-authority clinics; two industrial health centres for the Harlow Industrial Health Service, which is now being brought into being; and, it is hoped, a diagnostic and treatment centre to serve the town as a whole.

This paper tells of the planning and building of the three health centres now in use; it tells of the lessons in design which have been learnt; and of the even more important lessons in human relations and coöperation.

The definition of a health centre in section 21 of the National Health Service Act, 1946, applies only to buildings provided by the local health authority. The Nuffield Trust has already supported three experimental health-centre ventures which do not come within this definition. The Darbishire House health centre is a part of the teaching school of Manchester University; its unique features are that it is situated in an industrial-practice area, and that it brings radiology and pathology to the general practitioners' own door. The Nuffield Diagnostic Centre at Corby provides a close link between the general practitioners of Corby and the consultant clinics, without replacing the general practitioners' surgeries. Haygarth House, the small temporary health centre at Harlow, came closest to what had been envisaged when the National Health Service Act was going through Parliament. Moreover, because of its position outside the Act, this small centre was able to bring the general dental services fully into the picture for the first time, to the benefit of dentists, doctors, and patients. The building of Haygarth House was fully described at the time of its opening three and a half years ago (Taylor 1952); the dental side of the work there has also been described (Keen 1953).

From Haygarth House we learnt the virtue of smallness. There were many complaints about lack of space; but compulsory close living of doctors, dentists, local-authority officers, health visitors, midwives, and secretaries, in the service of about 8000 patients, helped to teach the value of coöperation and mutual help. Doctors and dentists became colleagues in diagnosis and treatment; doctors and health visitors colleagues in social medicine. The local-authority clinics were soon an everyday part of the life of the general practitioner; the county and area medical officers of health familiar friends.

The success of the Haygarth House experiment was a factor which influenced the Nuffield Trustees in deciding to support further developments at Harlow. So when the proposals of the Harlow Development Corporation, prepared in coöperation with all users, looked like being pigeon-holed for lack of capital, the Trust underwrote the project, using the Development Corporation as its managing agent, and the Nuffield Health and Social Services Fund as the property-holder.

### Unique Features of the Harlow Health Centres

The features which are unique to the Harlow project are as follows:

1. *Coverage.*—Already almost all general practice in the new town proper is, or is to be, conducted from the health centres, in day-to-day association with the local-health-authority clinics.

2. *Special services included.*—The centres house dentists in general N.H.S. dental practice, as well as local-authority priority dental services.

3. *Timing.*—Because the centres have been built simultaneously with the growth of the town, there has not been the problem of disturbing existing patterns of practice.

4. *Main place of practice.*—All official health centres so far built have been subsidiary to general practitioners' surgeries elsewhere. The Harlow centres are on the general-practitioner side in effect group-practice houses, replacing private surgeries. In this they resemble the Darbishire House health centre at Manchester.

5. *Design* has achieved efficiency, with great economy. In consequence, no Government capital grants have been sought. A special money-saving feature is the use of a common waiting-room for the general practitioners and the local-authority clinics.

6. *Finances* are so arranged that tenants pay economic rents, to cover maintenance and administration, and capital charges. In consequence, centres of the Harlow type can be reproduced elsewhere, provided the necessary capital advances are available, and the necessary planning skill and coöperation are forthcoming.

A further advantage of this arrangement is that all users scrutinise design-costs most carefully, since these will be reflected in due course in their rents. Luxuries are avoided, and common usage achieved whenever possible.

7. *Demonstration of good practice.*—Harlow new town is a pattern of living for the future. The Nuffield Trust has backed the Harlow health project as a demonstration of the conditions of good general practice, in association with all other local health services. Conditions are not only physical; personal relations are even more important. There have been long and detailed negotiations between the general practitioners in particular and the Trust, to work out conditions of tenancy which are fair to all, and at the same time keep up high ethical standards within and between the centres. The lessons learnt here may well have general application.

### The Story of Harlow

Three and a half years ago, when the Haygarth House temporary health centre was opened, new Harlow had about 700 houses and flats occupied; its population was about 2500.

Today the situation is very different. About 6400 houses and flats are occupied by over 22,000 new residents. By 1958 it is expected that 12,000 houses and flats will have been completed, housing over 40,000 people. The town will then have just passed its half-way

mark towards its ultimate target of a population of 80,000—much the same size as Cambridge.

The town is much more than an agglomeration of houses and flats. An advantage of the Development Corporation is that it can take a wider view of community planning than has been possible for other developers in the past. Much community development must be done by local authorities or private or individual enterprise; but a Development Corporation can provide powerful stimuli.

These developments in Harlow up to September, 1955, are as follows:

| | |
|---|---|
| Factories completed | 54 |
| Persons employed in the factories | 5740 |
| Schools completed: | |
| Primary | 6 |
| Secondary | 1 |
| Churches and church-halls opened or reopened | 4 |
| Shopping centres completed: | |
| Main | 1 |
| Subsidiary | 6 |
| Community centres: | |
| Main | 2 |
| Tenants' common-rooms | 8 |
| Public-houses completed | 2 |

There are also sports grounds, children's playgrounds, a paddling-pool, allotments, and such basic and expensive services as water-supply and sewage-disposal.

On the social side, there are now over 200 voluntary bodies in existence, including religious, political, trade-union, sporting, and educational groups.

The object of building Harlow and the seven other new towns around London is to relieve the Metropolis of some of its excess population. So the people of Harlow are primarily Londoners, particularly North Londoners, who come out with their industries. When a factory moves to Harlow, its employees are given the chance to come; as a rule more than three-quarters of the men, with their families, decide to make the move. Those who

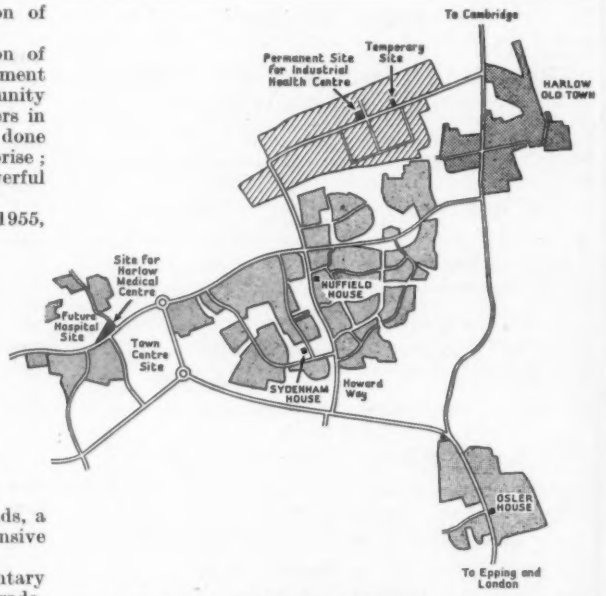


**Fig. 2—The location of the three health centres in the parts of the new town of Harlow already completed.**

stay behind are mainly the older folk with the strongest local ties. In consequence, the families of Harlow are mainly young. Many of them have never had a home of their own before; besides embarking on hire-purchase of furniture and television, most soon decide to start or to increase the family. In consequence, nearly a quarter of the population of Harlow is under 5 years of age. Again in consequence, calls on the doctor are numerous. Moreover, the young parents in a new environment feel they must take all possible precautions to rear a healthy family; again, this leads to an extra medical burden, though also to an extra medical opportunity. Similarly, in the dental practices an outstanding feature is the large number of children who have to be treated.

Secondly, the combination of high rents, hire-purchase payments, and more mouths to feed means that at Harlow most families have a tough financial struggle, especially in their first two years. This is a common enough experience for the newly married everywhere; but in Harlow almost everyone is sharing the experience at the same time. A popular daily newspaper once

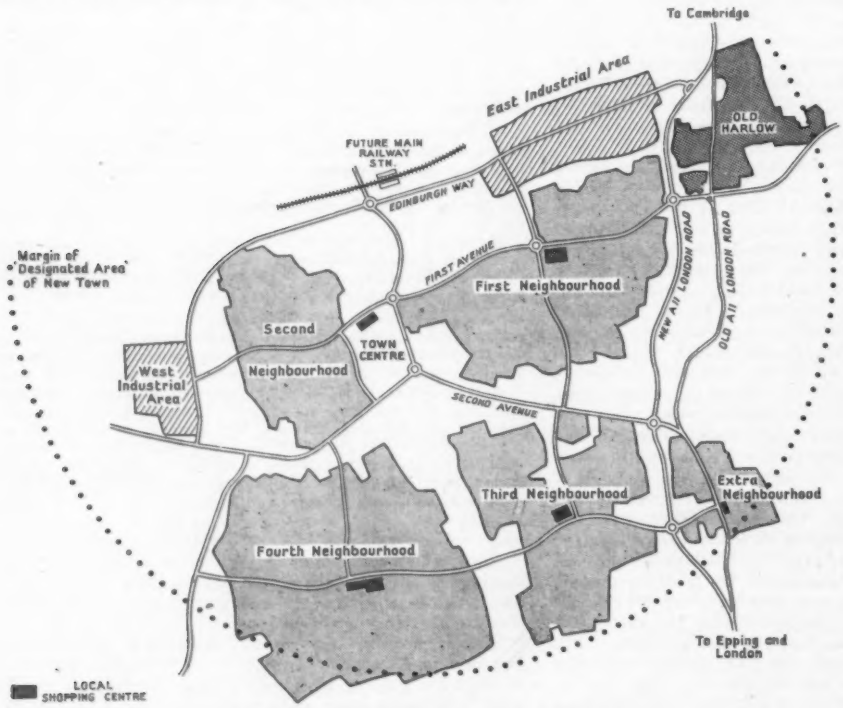


**Fig. 1—Harlow New Town, simplified master plan.**

referred to Harlow as "'Pram Town'—where there's a hole in every pocket and a smile on every face." Though this is broadly true, there are a number of exceptions. The financial anxieties of many young parents are such as to make them dread falling ill, or losing overtime. In consequence, newcomers sometimes suffer from justifiable anxiety states. Happily, these appear to be self-curing as hire-purchase payments come to an end.

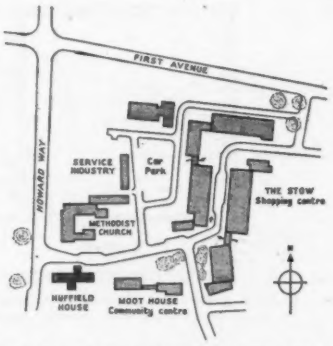


Fig. 3—Location of Nuffield House health centre in the neighbourhood centre, showing its relation to shops and other public buildings.

### The Master-plan and the Health Centres

Harlow owes its master-plan to a combination of topography and its master-planner, Mr. Frederick Gibberd, F.R.I.B.A. The plan is shown, in simplified form, in fig. 1. Inside the designated area the New Town Development Corporation is both the planning authority and the main building agency.

Natural valleys divide the site into four main areas, in each of which a neighbourhood is being, or will be, constructed. The population of the four main neighbourhoods will vary from 12,000 to 25,000 or more. Each neighbourhood is surrounded by wedges of green, and the main roads to the town centre run through these 'green fingers.'

The first neighbourhood, the Mark-Hall/Netteswell neighbourhood, is now virtually complete. The second neighbourhood, the Hare-Street/Little-Parndon neighbourhood, is under construction. Building in the third neighbourhood of Tye Green has just started. A small extra neighbourhood at the south-east corner of the designated area, an extension of a ribbon-village called Potter Street, is also virtually complete.

The location of the two industrial estates is shown in the simplified master-plan. From each neighbourhood, cycle-tracks enable workers to get from their homes anywhere in the town to work-places in under ten minutes. These tracks are separate from the roads; where possible, they avoid the major roads by underpasses.

The position of the first three health centres of Harlow, in the Mark-Hall/Netteswell neighbourhood and in Potter Street, is shown in fig. 2.

Haygarth House, the first temporary health centre, was situated in Mark Hall North—that is, the part of the first neighbourhood lying north of First Avenue. Its permanent successor, *Nuffield House*, serves the northern half of the first neighbourhood from the main shopping centre of the area called The Stow (fig. 3).

The southern part of the first neighbourhood, on both sides of a spine road, is served by the *Sydenham House* health centre, adjacent to a shopping subcentre, and overlooking a cricket field (fig. 4).

The small *Osler House* health centre in Potter Street is located in Prentice Place, a new shopping centre; it is continuous with the shops, and has flats over a part of it (fig. 5). The A11 road, which at present skirts one side of Osler House, will in a year or so be diverted out of Potter Street to a new position indicated in fig. 1.

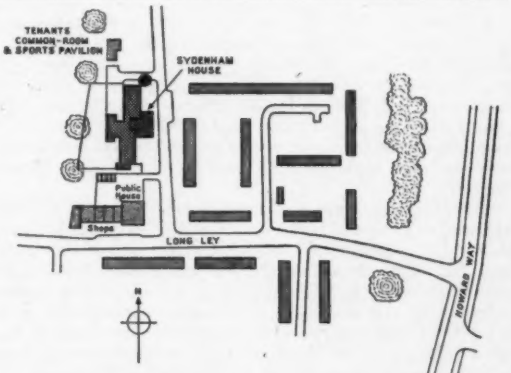


Fig. 4—Location of Sydenham House health centre, adjacent to a shopping subcentre and other community buildings.

### Basic Planning Considerations

The first step in launching a health centre or group-practice building is to prepare a directive for the architect. This will be revised several times; in its final form it is a key document, for it will definitely determine the main features of the building which comes out at the end. Most clients brief their architects inadequately, so architects have to imagine what is needed without precise knowledge.

The directive should cover the following points:

1. *Cost.*—Give the architect a figure for his building knowing that it will probably be exceeded. Remember that to the building costs must be added: (*a*) cost of site; (*b*) cost of civil engineering works on site; (*c*) fees of architects, quantity surveyors, and lawyers; (*d*) cost of furniture, if this is to be provided.

At Harlow the Nuffield Trust set aside a figure of £24,000 for each of the two larger centres. It was assumed that building costs ought to be kept to £18,000. So architects were asked to work to £17,500. For the smaller centre the figures were £12,000, £9500, and £9200.

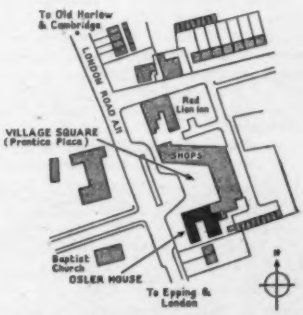


Fig. 5—Location of Osler House health centre in relation to a shopping square and other community buildings.

From the Harlow figures it is possible to calculate costs of health-centre provision in terms of patients at risk. For 10,000 patients the cost for general practitioners, clinics, N.H.S. dentists, and local-authority dentists will be about £25,000 exclusive of furniture at 1954 prices, or £2 10*s.* per patient at risk; for general-practitioner services alone the figure is about £1 per patient at risk. However, building prices have risen rapidly in the last year, and are still rising.

2. *Site.*—The limiting factor is taken as the distance a mother can conveniently push a pram. The ideal site is close to a natural place of concourse such as a shopping centre, but it should be reasonably quiet. There must be adequate parking space for staff, and, increasingly, for patients.* The general practitioners must be able to get their cars in and out swiftly and unimpeded.

* The Harlow Development Corporation is now planning a garage for every other house.

3. *Content.*—Each health centre had to house general practitioners and clinics, with rooms for secretary-receptionists, health visitors, and home-nurses. It was decided to have general dental suites at both the larger centres, but a local-authority dental suite for priority classes at only one centre. The architect must be made aware from the outset of the special gas, water, and electrical arrangements needed in a modern dental surgery.

The following were also considered, but were decided against for practical reasons: (*a*) dispensary or chemist's shop; (*b*) ophthalmic optician; (*c*) chiropodist. It was felt also that the proper place for open-access pathology and radiography was at the town centre adjacent to the hospital. The town centre will not be more than eight minutes by bus from any part of the town, and to dilute these services by reproducing them in each health centre would be costly and inefficient.

4. *General character.*—The buildings were to be domestic rather than institutional; patients were to feel at home. This was one of the lessons we learnt from Haygarth House. The features of domestic building in this context are:

(*a*) *Rooms* not too big, and, above all, not too high. A small high room is miserable and hard to heat. The maximum height for consulting-rooms and other small rooms was given as 8 ft. 9 in.

(*b*) *Windows* not too big, and opening properly top and bottom. Given half a chance, architects equate health with the solarium or greenhouse. The result is hot and glaring in summer and cold in winter. A consulting-room is a confessional; as Sir Thomas Moore observed in his *Utopia*, too much light dries up the mind and drives out thought. It is also an undressing room; only exhibitionists like undressing in an aquarium.

By contrast, a dental surgeon needs big windows to catch as much natural light as he can for his operative procedures; preferably with a north aspect.

With windows, we have had some successes and some failures. A consulting-room must be capable of rapid ventilation to get rid of body smells, while still retaining privacy and quiet. A doctor works there five hours a day; if possible he should have a nice view.

Good ventilation is obtained with the familiar sash window, with cords and weights. But such windows have had to be ruled out on cost. The rotating window, which opens inwards above and outwards below, has much to commend it; but, when opened, the upper part projects into the room, pushing out of place the net or other curtains. Even with opaque glass, such curtains are essential for privacy when windows are open.

(*c*) *Furniture* and *pictures* to be chosen with all the care of those at home. No tubular stackables or other institutional items.

5. *One storey or two.*—We soon found that all users wanted to be on the ground-floor. The dentists wanted easy entry and separate exits without stairs by-passing waiting-rooms for those who had had extractions under general anæsthesia. The general N.H.S. dentists have patients throughout the day; so their "stream" had to be kept separate from that of general practitioners and clinics; they rightly insisted on parity of "scale of entry" with the doctors. They preferred that their entrance should be separate from that used by the local-authority priority dental patients. With so many complicated circulations, our architects were unanimous in advising single-storey buildings; on cost there was little in it either way.

6. *Entrances.*—The building is for the patients. The main entrance should reflect this. Streams should be kept separate without wasting staff on an inquiry point. Doctors must have an emergency entrance, so that they can slip in and out in emergency without being seen by the patients.

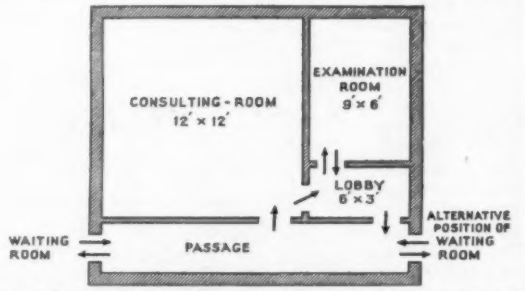


**Fig. 6—Basic general-practitioner consulting-unit as advocated in the Nuffield *Good General Practice* Survey (Taylor 1954).**

7. *Pram shelters.*—We have noticed these are not used unless they are right by the front door. Prams are built for use in the rain, so a pram-shelter needs a roof but no walls; it need be no more enclosed than a bus-shelter.

8. *Heating.*—For buildings of this size we had to decide reluctantly against central heating, because of capital cost and because it would have meant employing at each centre a man as a stoker-caretaker. The extra wages would have more than offset the saving in fuel. Water-heating is by gas or electricity, and space-heating is by electricity. Each tenant's rooms are metered separately, and the cost of heating the common-rooms is shared. Incidentally, cleaning is dealt with on a similar basis.

9. *Floors.*—Experience at Haygarth House made us decide against thermoplastic tiles. In two health centres wood blocks have been used, and in the third cork tiles treated with a plastic non-slip resin. One dental suite has lino-tiles.

## Details of Planning and Design

Here pictures speak louder than words. The reader is referred to figs. 6–9. Fig. 6 shows the basic general-

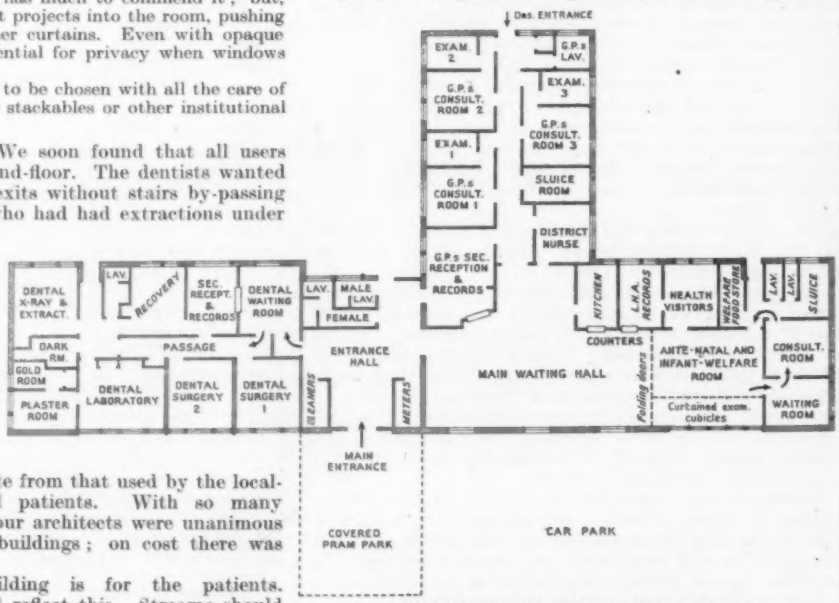


**Fig. 7—Nuffield House health centre, internal layout.**

practitioner consulting-unit. It is taken from the Nuffield survey of *Good General Practice* (Taylor 1954), where the case for it is fully argued. To save money, room sizes have been reduced below the ideal; at Osler House, Potter Street, the practical minimum has been reached.

The *general-practitioner units* in each health centre follow closely those advocated for group-practice in *Good General Practice* (chapter VIII, pp. 202–250). In this chapter also there are examples of detailed directives to architects. *Couch positions* in consulting-rooms and examination-rooms must be decided early, as they determine the positions of light fixtures. A right-handed

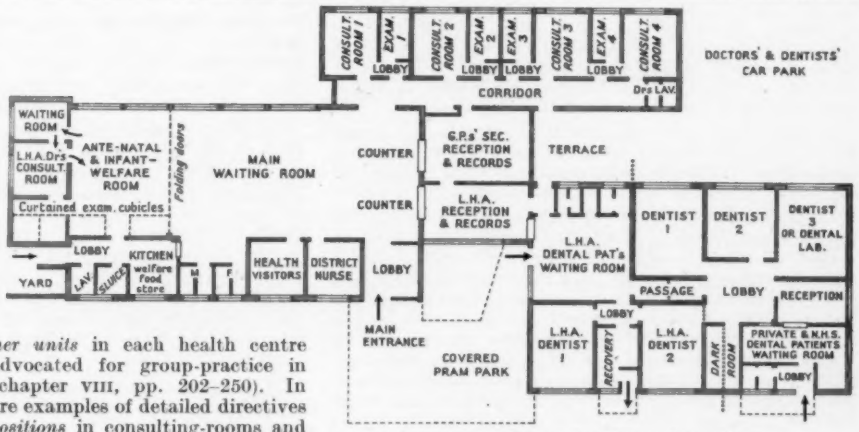


Fig. 8—Sydenham House health centre, internal layout.

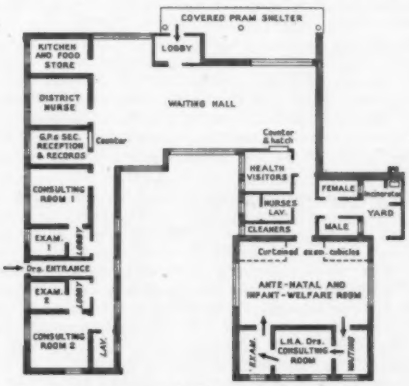


Fig. 9—Osler House health centre, internal layout.

doctor stands on the right of the patient. Desk and chair positions will influence the position of sinks.

*Waiting-rooms.*—The pros and cons of one large waiting-room or several small ones have been fully thrashed out. Cost precluded our having both. For local-authority antenatal and child-welfare clinics a large waiting-room is a great advantage; it can be used for group-discussions, lectures, and even exercise classes. For the general practitioners it means that one secretary-receptionist can oversee all the patients and direct traffic flow. The same room can be used by general practitioners' patients in mornings and evenings, and by clinic patients in afternoons.

So we decided in favour of large waiting-rooms.

The risk of unhomeliness we have tried to avoid by careful furnishing (fig. 10). There is, too, the problem of the patients not knowing who is next, when there are several general practitioners working at one time. We are trying to break up the large rooms into three or four parts, by using bookcases, settees, and flowerstands as movable barriers.

At Haygarth House we had to combine medical and dental waiting-rooms. This was not a success. Dental surgeons must have separate waiting-rooms, as part of their own suites.

*Clinic rooms.*—Here we are still experimenting. At each health centre there is a main clinic room for weighing and other purposes. In the larger health centres it can be united with the main waiting-room, by throwing back folding-doors. The result is a fine hall for lectures or meetings.

In the main clinic room there are two or more curtained cubicles. These may be used for undressing, or for midwives' antenatal examinations. Off the clinic room is a suite of two or three rooms which may be used in several ways:

1. Consulting-room with waiting-room and examination-room.
2. Consulting-room with two examination-rooms.
3. Two consulting-rooms with examination-room.

We have learnt that a clinette is less necessary than it was, since almost all antenatal patients bring up specimens in bottles. There must, however, be a patients' lavatory, and a specimen-testing room.

Fig. 10—Large waiting-room at Sydenham House to show the attempt to create a homely atmosphere by appropriate use of furniture.

*Hatches for reception offices and kitchens.*—These must be opaque. When a hatch is shut the surgery or clinic is closed, and the receptionist must become a secretary if she is to get through her work; a transparent hatch at Osler House had to be replaced.

A hatch must open fully, so that patients and receptionist can talk face to face. It should have a proper counter, on which the receptionist can write. It should command the whole waiting-room.

There is no need to list the *other rooms*. They can be seen in the diagrams. The sluice-and-specimen room at Nuffield House is in effect a laboratory for minor pathology, as well as a wash-up place for soiled mackintoshes and pus in kidney dishes. The closest relation between district nurse's room and general practitioners' rooms is achieved at Nuffield House. Space for storing welfare foods may be too small now that the local authority has taken over the full job from the Ministry of Food. There must be enough lavatories for patients and staff, but not too many.

*Dental accommodation* at Nuffield House has been planned to give something approaching ideal conditions for general dental practice. There is a spare surgery, used for the following:

1. "Pain cases" calling without appointment and needing immediate treatment.
2. Radiographic examination.
3. Gas extractions.

This surgery is sound-proofed from the waiting-room by distance and intervening doors and walls.

There is a recovery-room near the "gas room," with a separate exit short-circuiting the waiting-room. The secretary-receptionist in her office can oversee the recovery-room as well as the waiting-room, and she is still near the main dental surgeries. The laboratory accommodation is so large because it is to serve the Sydenham House dental surgeries as well.

## Human Relations

The human side of making our health centres work is even more important than their physical design. Wise physical design can help coöperation. But coöperation is impossible unless the right human solutions are found.

In a sense, it is like treaty-making at Geneva. We must first have a common interest, to provide a touchstone for our judgments; this we find in the cure of sickness and the promotion of the health of our patients. We are each sovereign States, and none of us must seek, or be allowed, to dominate over the others. Each of us must preserve his integrity and essential freedoms; and each has to make sacrifices and compromises for the common good. We have to codify our relations one with another in wise treaties and laws. And we must agree on police action if any of us go off the rails.

The parties involved have been:

1. The general practitioners.
2. The dental surgeons.
3. The local health authority, the Essex County Council.
4. The Local Executive Council for Essex.
5. The Harlow Development Corporation, in its planning and building capacity and as agent for the Nuffield Trust.
6. The Nuffield Provincial Hospitals Trust.
7. The Nuffield Health and Social Services Fund.
8. The solicitors or land-agents for parties 1, 2, 3, 5, and 6 above.

One of us (S. T.) has acted as ambassador-at-large or courier between the parties; this arrangement, combined with negotiations in twos and threes, rather than at round-table conferences, has been found the method of choice. In the negotiations, we have been fortunate in having the guidance and wisdom, especially at times of difficulty or deadlock, of the secretary of the Nuffield Trust, Mr. L. Farrer-Brown: we look forward to his continued help, as a trustee, and as a director of the Nuffield Health and Social Services Fund.

Those of us who are in practice, medical or dental, express our thanks to the chairman, members, and officers of the Essex County Council and its health committee, and in particular, the former medical officer of health, Dr. Kenneth Cowan. It is fatally easy for a public authority to stop progress by saying "no," or by acting so cautiously that all progress ceases. With our friends of Essex, it has been just the reverse. Both Dr. Cowan and his successor have been ready to accept general practitioners as full colleagues in preventive medicine, and have been ready to trust us as we have come to trust them.

This coöperation between the county and the general practitioners has had three immediate and valuable results:

1. The county has made full use of general practitioners to staff their antenatal and postnatal clinics, and, where the general practitioners have had a special interest or training in pædiatrics, their infant-welfare clinics as well.

2. The county has encouraged general practitioners to make full use of their health-visitors in the day-to-day practice of social medicine. In consequence, it has become routine for general practitioners and health-visitors to consult together daily on cases of mutual interest. In the new health centres this is greatly assisted by the closeness of the offices of the health visitors to the general practitioners' consulting-rooms.

3. The county has set aside a room in their part of each health centre, conveniently near the general practitioners' rooms, for the home nurse to hold her clinic each morning. Here she sees her own ambulatory cases, as well as any general practitioners' cases requiring injections, dressings, or other straightforward nursing treatment. This, too, is a valuable new link; it lightens the work of the practitioner; it enables the home nurse to treat as ambulatory some patients who might otherwise have to be treated at home; and it helps the practitioner and the nurse to discuss personally those cases where home nursing is in progress, instead of having to rely on written notes.

The general practitioners must thank also the local executive council for their coöperative attitude over entry into the health centres. Like us, they have been faced with new problems to which there were no ready-made solutions. Thanks to good sense on both sides, we believe that experience is teaching us the right answers.

## Entry into the Health Centres

When Harlow New Town started to grow in the North-East Essex countryside, it was an open practice area. As a result of private initiative by general practitioners it is now a schedule-2 (intermediate) area. That is to say, new doctors are warned that their chances of list-building are limited, and no basic salary is available during the initial years of practice.

To "squat" in Harlow has been more than an act of faith; it has needed courage and the financial strength to exist, until one's practice has been clothed by the Development Corporation's housing.

It is a principle of modern town and country planning to discourage the use of the home for professions and businesses; it is held that these should be carried on at the places of concourse of the population, in buildings specially intended for the purpose. This philosophy applies to general medical and dental practice, as much as to the law, accountancy, estate management, and the rest.

Since the N.H.S. Act (1946), local executive councils have been able to regulate the inflow of new doctors,

so that a fair balance between demand and supply is maintained. In completely new towns and housing estates, this regulation is reinforced by the control over property-use which the estate authority exercises.

We are not concerned with the wisdom of this. We merely record that the Harlow Development Corporation is providing offices, shops, and workplaces in each neighbourhood for professional and business people, on a scale adequate to meet the needs of the local community. As a corollary, the corporation does not allow its dwelling-houses to be used for the practice of a business or profession, or for the erection of a professional or business plate, notice-board, or sign. This means that professional people may not conduct practices from corporation dwellings, though it is understood that doctors who live in corporation houses may from time to time see patients in their homes as a matter of convenience, urgency, or emergency.

The Harlow Development Corporation has made it clear repeatedly that it is no part of its job to select general practitioners. If selection is necessary, it must be done by the body with the necessary professional competence—namely, the local executive council. On the other hand, the corporation cannot control what happens in premises which it does not own.

In fact, most of the doctors in the new town either have selected themselves by opening up in private premises, or have started as outposts of existing partnerships in the old town or elsewhere. If they have communicated with the development corporation in advance, they have been warned of the hard time which they must face, and given no official encouragement.

But once they have established themselves in new Harlow and acquired enough patients to show that they are there to stay, the corporation has done its best to help them to serve their patients. Temporary premises have been made available in shops or dwelling-houses, on the strict understanding that they will be vacated when something more permanent has become available. These doctors have, in fact, become the first tenants in the Trust's health centres; and doctors are already established in the areas where the next two health centres will be built.

### Principles of our Treaty-making

The conditions of tenancy which have been thrashed out become intelligible if the purposes behind them are kept in mind. There are four groups of people whose reasonable interests have to be protected. So conditions of tenancy have had to be devised to achieve what follows:

1. *To give reasonable safeguards to the doctors who enter the health centres against the consequences of so doing.*

Inevitably, any practice is closely linked with the place from which it is carried out. A doctor who gives up a private surgery to enter a health centre can therefore reasonably ask for proper security of tenure in his new work-place.

Any grouping of doctors in one spot enables them to give a better service to the public. But, in the outer part of the area served, patients have to walk farther than if the same doctors were dispersed. Competitors "squatting" in such places would have an unfair advantage. In an open or intermediate area, there can be no absolute ban on such "squatting." But at least the doctors in the health centres can agree not to do it to each other.

A doctor in a health centre who opened a branch surgery near another health centre might gain a temporary advantage. But in the long run reprisals would be inevitable, with both sides increasing their overheads, to nobody's ultimate advantage.

2. *To give a reasonable assurance to the public that, in any area, there are enough doctors, and a reasonable choice of doctor.*

There are enough consulting-rooms in the health centres to meet this proviso, if they are all occupied. If the doctors in a health centre fail after a reasonable time to rent all the available consulting-rooms, and if more doctors are manifestly needed, there has to be machinery for filling the vacancies.

3. *To ensure that the conditions inside the health centres are in accord with the purpose of providing a demonstration of good general practice.*

Principals and partners entering the centres enjoy real advantages. They work from buildings prominent in the neighbourhood. The local-authority clinics automatically attract young mothers. Physical conditions for both patients and doctors are far better than in most surgeries. The sacrifice, if it is sacrifice, which they are asked to make in return is that they should agree to set an example of good ethical behaviour to one another and to their juniors. Such behaviour may be to the temporary financial disadvantage of the doctors concerned. But over the years, the returns which it should give, in terms of happy and contented partnerships, make it more than worth while.

4. *To make sure that assistants-with-a-view and junior members of partnerships are fairly treated. This is specially important in the light of the previous paragraph, and of the exceptional conditions for practice-building peculiar to a new town.*

The thinking here is based on the Trust's report on *Good General Practice*, and on the Cohen Committee's findings:

(*a*) Entry into established practice should normally be by assistantship-with-a-view.

(*b*) Partnerships or principals must select for themselves their own partners or assistants-with-a-view, preferably after public advertisement.

(*c*) Permanent assistants are undesirable, except in the most exceptional circumstances.

(*d*) Salaried partnerships or other forms of concealed assistantship are undesirable.

(*e*) Partnerships or principals should not repeatedly take on and dismiss assistants-with-a-view so that they become in effect salaried assistants.

(*f*) If incoming partners have to buy residential property or a share of other assets, it is in everyone's interest that there should be a certificate from the Medical Practices Committee that there has been no sale of goodwill.

(*g*) Incoming partners should attain full parity reasonably soon. The Cohen Committee's suggestion of seven years is in Harlow New Town reduced to four, since practices grow to full lists almost as swiftly as houses are built. If a partner is to be truly part-time, then a share equivalent to the time worked will be regarded as "parity." If a practice has a surgery outside the area covered, or to be covered, by the health centres, for example in Harlow Old Town, the provisions about full parity will apply only to the part of the practice worked from a health centre.

(*h*) Assistants-with-a-view and junior partners should be fairly treated over night work, weekend duties, and holidays.

(*i*) In return for this generous treatment, it would be expected that the younger members of a partnership would willingly carry rather more than their share of the work-burden, to help the seniors in their fifties and sixties.

(*j*) In the event of dissolution of partnership, each principal should be able to continue to practice from his consulting-room in the centre.

### Principles into Practice

The actual conditions of tenancy translate into practical terms the principles set out above. They can therefore be stated quite briefly:

1. Consulting-rooms (with the use of all other necessary facilities) are let to individuals or partnerships.

2. Lettings to partnerships are made "jointly and severally" (to meet para. 4*j* above).

3. Before a tenancy to a partnership is granted, or extended, the partnership agreement must be approved by the Nuffield Trust, to see that it is in line with conditions 4*c*–4*g* above.

4. The agreement shall also be approved by the Medical Practices Committee, and a certificate obtained under Section 35(9) of the N.H.S. Act (1946).

5. Leases to principals or partners shall be for 21 years (or less if they wish), with the option to renew for a further 21 years (or less), the rent on renewal to be subject to negotiation.

6. Leases of consulting-rooms for assistants shall be for one year; with possibly two annual extensions. When an assistant becomes a partner, a long-term lease is granted.

7. Two doctors may occupy only one consulting-room, whether as principals, assistants, or locums, in emergency or temporarily, or after written permission from the Trust, such permission not to be unreasonably withheld.

8. Long-term tenancies of more than one consulting-room will not be granted to a single doctor.

9. A doctor practising from a health centre shall not conduct a regular surgery or exhibit a plate or board elsewhere in the area of the New Town served, or to be served, by one of the Trust's health centres.

10. If a partnership fails to grow to meet the medical needs of an area, the Nuffield Trust retains the right to let vacant consulting-rooms to doctors not in partnership with those already in a health centre.

### The Consultative House-committee

In each health centre, a consultative house-committee has been set up. On these sit all the doctors and dentists working in the centre, with representatives of the local health authority, the local executive council, and the Harlow Development Corporation, as the Nuffield Trust's agent.

Since the committee is advisory only, assistants can attend to learn about the work of the health centre. The committees meet regularly, and the corporation provides secretarial help until the general practitioners are in a position to do so. The committee elects its own chairman.

The first of these committees, at Haygarth House, worked well. In its first year it met every two months; in its second year quarterly; thereafter meetings twice a year were found to be quite enough to cope with any problems which arose. On the committee, understanding between the general practitioners, the dentists, and the local health authority grew up, and the many day-to-day details and small potential causes of friction were swiftly and easily ironed out.

It is the hope of the Nuffield Trust that all the doctors working in a health centre, whether in one or more partnerships, will coöperate to work a rota system covering night duties, half-days, and weekends. Such rota systems are in operation.

### Rents, Rates, and Furniture

Tenancies of the general practitioners' suites and the waiting-rooms are for furnished premises. Tenants are responsible for replacing furniture and for internal decoration and repairs. The Essex County Council has very kindly furnished its rooms in line with what has been done by the Trust.

Rents have had to be exclusive of rates, since it is impossible to predict what the rates will be over the years. The rent per general-practitioner consulting-room works out at about £130 p.a. exclusive. The general practitioners provide their own secretary-receptionists and cleaners.

Dentists' rents have been subject to detailed negotiations, based on the amount of accommodation occupied. Moreover, dentists' rents, like the county-council rents, are for unfurnished premises; though the county does use the furniture in the common waiting-room.

At first sight, it may seem that the rents compare unfavourably with those of certain local-authority centres, particularly where these rents include the use of secretary-receptionists. But in such local-authority centres rents are heavily subsidised, to make it possible for the doctors to enter the health centres; they still have their own individual surgeries to maintain, often with their own secretaries outside. At Harlow the position is that of a group of doctors renting a house from an ordinary landlord.

The rents charged in future health centres might be higher than those in the first three health centres. Building costs are rising rapidly, and the Trust's provision as to return on capital will presumably still hold.

### Dentists in the Health Centres

From the outset those of us who are dental surgeons have made it clear that our conditions of practice in the N.H.S. differ in certain essentials from those of general medical practitioners. First, ordinary N.H.S. dental practice is not permitted from health centres proper. Therefore we have sought and received guarantees in our leases that the Trust's health centres will not become health centres proper.

The sale and purchase of goodwill of dental practices has not been abolished, and no compensation has been paid. In other words, when dentists retire they still have to sell their practices with equipment to their successors, to provide for their own retirement. This means that it is essential for us to be able to nominate our successors in health-centre practice as elsewhere.

Dental practice is completely open, and dentists can "squat" anywhere without restriction; so although the Harlow Development Corporation restricts the practice of dentistry, the dentists do not have quite the advantages enjoyed by the general medical practitioners. Dental practices are geographically less circumscribed than medical practices, so we have had to reserve the right to practice outside health centres in answer to competition. This has been felt by our landlords to be reasonable, if only as a deterrent against uneconomic opposition.

### THANKS

Because this enterprise is an essay in coöperation, many people have played their part.

We must thank specially Lord Nuffield and those he has chosen to see that his money is wisely spent for the good of mankind. But for his generosity and their imagination, there would be no health centres in Harlow.

Thanks are also due to:

The successive chairmen, members, and officers of the Essex County Council as local health authority, particularly the past and present chairmen of the county health committee, Ald. Mrs. M. Ball and Ald. K. E. B. Glenny, O.B.E.; the officers of the health committee, especially the health visitors, midwives, and home nurses and their superintendents.

Mr. H. E. Bates, the chairman, and the members and secretary of the Essex Local Executive Council; especially Dr. H. N. Rose and Mr. E. Bergdahl, the secretary, who serve on our house-committees.

The chairman, members, and officers of the Harlow Development Corporation; especially the general manager, Mr. W. Eric Adams, C.B.E., the comptroller and general manager elect, Mr. B. Hyde Harvey, Mr. J. R. Jacques, solicitor to the corporation, and Miss J. B. Payne.

The architects: for Nuffield House, Messrs. Booth and Ledeboer, F.F.R.I.B.A.; for Sydenham House, the corporation with Mr. D. L. Dyer, A.R.I.B.A., in charge; for Osler House, the corporation with Mr. A. McCowan, A.R.I.B.A., in charge; the architects for the Harlow Development Corporation are Mr. F. Gibberd, C.B.E., F.R.I.B.A., architect-planner, and Mr. Victor Hamnett, A.R.I.B.A., executive architect.

The contractors: R. C. Darlington & Sons Ltd., W. & C. French Ltd., and J. & J. Dean Ltd.

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# In England Now

*A Running Commentary by Peripatetic Correspondents*

DURING the warm weather, from a corner house in the consulting area of the Metropolis, I have conducted a psycho-sociological study of the electro-salpingophonist or common motor-horn-blower. According to my classification motor-cornucacophonists fall into five groups—manic-depressive, schizophrenic, compulsive-obsessive, anxiety-neurotic, and moronic. I have found that there is a definite correlation between the diathesis of the driver, the vintage of the car, and the volume of the sound. There is also an associated relationship between the chromium content of the pars anterior of the vehicle. Tall asthenic individuals in older cars tend to blow their horns less than obese pyknosomes in neoplastic, heavily chromicised automobiles. For those who have little time for the profundities of the subject, I suggest the following useful, but simplified, classification.

1. The excessively timorous, maternally dependent type. (These are candidates for colitis, cortisone, and colectomy.)

2. The frustrated, aggressive paternally, antagonistic type. (These will probably require gastrectomy or sympathectomy in the near future.)

In minor subgroups we have the sauve-qui-peut blower, who has an ungratified death wish but is loth to involve other ids; the van-drivers of the *Nocturnal Intelligencer* are a good and fairly homogeneous example of this subgroup. Another subgroup includes the joie-de-vivre musician who is probably a harmless dissociated personality.

Most of my investigation has been carried out by perfenestral ectoscopy, a valuable method which needs no special apparatus. Its only inconvenience is that it must be carried out without loss of time, so that valuable clinical material is not wasted. I must thank all my private patients who have given me the time for my researches, either by late arrival or complete absence.

* * *

"FOREN LETAS" said the chalked writing on the railway coach. This was English (phonetic) at Liverpool Street Station, but it suggested that one was already well on the way to Denmark. "Lemon-juice and Orange-water" announced the menu on board the comfortable Danish ship, and a small raft on deck bore the sinister title "Rekwisitter." We turned to our phrase-book. "Hjaelp! (pronounced yelp)" was the first conversational gambit which it offered. A language which sounds like English often has surprising pitfalls. For instance, if a customs officer tells you to "Luk den op," you must open your bag, not lock it up. It was a British Minister of Food who was momentarily shaken by the announcement of his arrival in a newspaper headline: "Mad Minister Her." Moreover, words such as "sixpence," "speeder," and "speaker" are the appropriate Danish for cloth cap, accelerator, and radio announcer, while "marmelade" is jam and "middag" is evening dinner. It is important not to confuse øl (beer) with olie (oil), which might be pardonable after a schnapps or two at a restaurant with a name such as "Hos Bang." At Oskar Davidsen's restaurant in Copenhagen, the list of 177 smorrebrod dishes is 4 ft. long and proceeds from Superfine Export Caviar on Toast through Hans Andersen's Favourite, the Vet's Supper, the Union Jack Sandwich to the final modest Slice of Bread with Butter or Dripping.

The influence of the British Exhibition is evident in the streets and shops of Copenhagen. English books, materials, shoes, and clothes are on view. The tartans of the Scottish troops are already popular; a small Danish schoolgirl proudly wore a kilt and a sixpence. Denmark's own produce is unmatched, and nowhere than in Copenhagen can there be such elegant window displays and such a wealth of modern fabrics, light-wood furnishings, ceramics, silver and stainless steel table-ware. Contact with our European colleagues, always a rewarding experience, is particularly pleasing in Denmark, where habits of thought are in many ways similar to our own, and where the welcome is so spontaneous.

* * *

The medical assessment of Shakespearean characters seems to have become a respectable pursuit,[1] and if it extends we may soon expect a spate of learned observations by psychiatrists on the reactions of the audience to *Titus Andronicus* at Stratford. The mounting tension towards the end of the first act is an extraordinary sensation. The management has thoughtfully provided teams of St. John Ambulance girls who, all competence, cheerfulness, and starch, deal with those who exhibit emotional instability. A kind lady who sold programmes remarked that it was "always the men," and certainly it was five to one in favour of the so-called sterner sex in the part of the theatre where I was sitting. It is a sobering thought that the chap who was reduced to having a hysterical fit might have been the psychologist on duty.

* * *

With reference to my peripatetic colleague's potty-using cat, I must record that our cat was discovered trying to turn on the tap, having used the basin in my surgery. I presume he comes of a long line of Cambridge cats.

* * *

1955 will long be remembered for its ideal summer, and we should therefore be especially pleased that mid October has provided us with several more gloriously sunny days. These my father always looked forward to and taught me first to call St. Luke's summer. I truly celebrated this by eating the most delicious raspberries I ever remember tasting. A rough wind had blown over my scarlet runners on to a row of raspberries, and there they lay for about a week before I touched them. Then I discovered a second crop of raspberries which filled a porridge plate. They were more scarlet than the scarlet runners and more succulent, juicy, and definitely sweeter than any we had in the summer. Lunch with fresh runner beans followed by raspberries on Oct. 15 must be almost a record.

* * *

Ages ago
Before Chadwick and Snow
When the march of science was slow
Year after year
Babies died by the thousand from summer diarrhœa.
But when sanitation
Took hold of the nation
Unhygienic practices of every sort just had to go.
To give a baby a dummy
Was equivalent to being slummy.
It cannot be denied
That fewer babies died
But whether this was due to the decline of the
dummy we really do not know.

Now, thanks to goodness-knows-who
Dummies are no longer taboo.
Doctors prescribe them.
Doctors' offspring imbibe them.
Any baby with a pain in his tummy
Is liable to be offered a dummy.
Instead of sanitation
We have all this oral stimulation.

But consider the babies in the slums.
Wouldn't they be better sucking their thumbs?
They have to have fun
But what about *E. coli* oh-one-one-one?
Can you happily ignore
A baby being given a dummy right off the floor?
Do you say, "Giving him a dummy? That's fine,"
Taking the latest line,
Or do you tell the mother
She can't give the baby a dummy that has dropped
on the pavement,
She must buy him another,
Explaining in simple terms
The dangers of germs?

If you look around
You will see that the dummy is gaining ground.
They even give them out at clinics
Which should amuse the cynics.
I do not decry psychology
But—Chairs of Child Health please note—what we
urgently need
Is a little more bacteriology.

1. See *Lancet*, Aug. 6, 1955, p. 288.

# Letters to the Editor

## PREVENTING SMOG CASUALTIES

SIR,—The great London fog of December, 1952, was a disaster equal in magnitude to a major air-raid. Similar smogs may occur in future. It is, I suggest, the responsibility of the health service to provide emergency measures analogous to air-raid precautions for the prevention and succour of fog casualties in chronic bronchitics. In designing such a programme the following points are relevant.

(1) The occurrence and persistence of fogs are partly predictable, and on receipt of a smog warning all chronic bronchitics who are able could, if they wished, leave London for a few days to avoid the smog. Many older people are sufficiently free from commitments to be able to leave and could afford to go either to relatives or other accommodation. There are frequent rapid trains out of London and there is no need to travel long distances —e.g., at my home 30 miles south of London, at an altitude of 500 feet, there was a warm sun shining and clear blue skies while the smog was killing susceptible people in London.

(2) Chronic bronchitics ill enough to need hospital treatment should not be admitted to a hospital in the affected area, the wards of which would be full of smog, but should be *evacuated for treatment to hospitals outside the smog belt*. The regional boards have a number of premises on the South coast to which these cases could be sent, if necessary with the nursing staff from the wards of the hospitals in London to which they would otherwise have been admitted. These institutions could be used as convalescent homes for most of the year, so that beds could be made ready without delay when a smog emergency arose. There will always be hospital cases who, for various reasons, cannot be evacuated. For them effective air-conditioning plant, capable of smog filtering, should be devised and installed in selected hospital wards.

(3) For the smog-bound bronchitics who must stay at home in London, the number of air changes per hour in their living-rooms and bedrooms could often be reduced by weather-stripping of windows (widely used in other European countries) and fitting wooden door thresholds. Hoover Ltd. informed me that vacuum-cleaner models current in September, 1953, had a bag, the fabric of which retained particles between 5 and 10 microns. These machines would filter, I believe, 3000–4000 cubic feet of air an hour, which is the volume of an average room, and they should be tried out as makeshift air-conditioning plants with perhaps a modified filter bag. (The damp bag could be dried out at intervals with an electric hair dryer.)

Interim measures on the above lines carried out before smoke-abatement programmes come into action would save a number of lives.

The Mass X-ray Service
for South West London,
Grove Hospital, Tooting,
London, S.W.17. F. A. NASH.

## HÆMATOGENOUS OSTEITIS IN THE NEWBORN

SIR,—Mr. Dennison (Sept. 3) speaks with authority and experience about the treatment of acute osteitis in childhood. It is therefore all the more important that his advice about the use of antibiotics in treating the disease in the newborn should not remain unchallenged. He recommends that "whichever antibiotic is used, treatment with it should be discontinued as soon as the blood infection appears to be controlled": and his specimen case-histories show that it has been his practice to withhold antibiotics altogether when the case first came under his care (cases 4 and 5) or to use them only for a week or two (cases 1 and 2) or at the most four (case 3).

It is unnecessary to examine the logic of the arguments which he uses to support his advice, since the results which he describes speak for themselves. One patient developed 37 recognised metastases while under observation; another suffered repeated recurrences and was readmitted to hospital 12 times in the first eighteen months; and of his 41 patients, 4 died.

To prevent others being led to think that such results must still be accepted as inevitable in this disease, in spite of the antibiotics now available, I would like to summarise the very different experience of this department. During the past seven years 34 cases of neonatal osteitis have been treated. We have aimed in every case to continue treatment with the appropriate antibiotic until the bone infection has been completely eradicated (in addition to aspirating pus and removing sequestra as soon as detected). Since it is characteristic of osteitis in the newborn that the diagnosis is usually made late in the course of the disease (as judged by the fact that radiological changes are usually already present), we have not been surprised at the need to continue treatment for several months in some cases. To this policy we attribute the fact that no patient has developed a metastatic lesion after coming under treatment; and that recurrences have been extremely rare, and never repeated, so far. There was 1 death early in the series, due to infection by a penicillin-resistant *Staphylococcus aureus* at a time when we were unfamiliar with the use of alternative antibiotics.

A full report of these 34 cases is being prepared. Meanwhile, it seems desirable to give this brief account of a particular aspect of the subject, not only to encourage others to treat cases of this relatively rare but often crippling disease as adequately as possible, but also as a contribution to the current discussions about the proper use of antibiotics in various circumstances.

Department of Child Health,
at The Royal Victoria Infirmary,
Newcastle upon Tyne, 1, G. A. NELIGAN.

## SEQUELS TO ANÆSTHESIA

SIR,—Dr. Bedford's paper and the subsequent discussion brought out certain aspects of administration of nitrous oxide (and its mixtures) which are likely to be of value to anæsthetists. It has long been appreciated that nitrous oxide was a weak anæsthetic agent and that in unpremedicated patients, when combined with sub-atmospheric percentage of oxygen, its purported anæsthetic action was inevitably associated with greater or lesser degree of anoxia. In premedicated patients, however, it is possible to maintain anæsthesia (first plane of third stage), with oxygen concentration well above the atmospheric (33⅓ to 50%). Such indeed is the practice of most anæsthetists today. It is generally regarded that even lengthy operations can be carried on with safety to the patient. Recently, however, a clinical observation was made that patients anæsthetised with nitrous-oxide/oxygen mixture become cyanotic during the recovery period. It has further been ascertained that during this period the arterial oxygen saturation falls in some cases by more than 10%. This phenomenon, which was hitherto not understood, occurred despite ample ventilation and unobstructed airway after the removal of the mask, and it persisted for about ten minutes.

The researches of Dr. B. R. Fink [1] in the United States threw, however, a completely new light on the technique of nitrous-oxide administration.

The volume of nitrous oxide in blood depends on the pressure under which it is administered and its solubility in blood. Its solubility is about 20 times that of oxygen. A 75% mixture of nitrous oxide causes 100 ml. of blood to absorb 30 c.cm. of nitrous oxide. In equilibrium the partial pressure of a gas in solution is equal to the partial pressure of that gas in the atmosphere above the solution. Therefore the

1. Fink, B. R. *Anesthesiology*, 1955, **16**, 511.

blood and the tissues of a patient undergoing nitrous-oxide/oxygen anæsthesia will absorb nitrous oxide until the partial pressure of nitrous oxide is in equilibrium. When, however, the patient begins to breathe room air, the tension of nitrous oxide in the blood now exceeds that in the alveoli and the gas begins to diffuse out of the blood into the lungs. The air now drawn into the alveoli during inspiration mixes with the outwardly diffusing nitrous oxide. As a result the alveolar partial pressure of oxygen is reduced below normal (atmospheric). The inhaled oxygen is diluted by the exhaled nitrous oxide. This phenomenon is called diffusion anoxia.

Dr. Fink states that this terminal sub-oxygenation may be harmless and the patient returns to normal at the end of ten minutes, but on the other hand in certain poor-risk cases it may have grave repercussions and may even be the cause of death. It follows that in order to prevent diffusion anoxia it is imperative to administer 100% oxygen for several minutes before removing the mask from the patient's face—i.e., until nitrous-oxide diffusion has slowed down. In bringing this phenomenon to the notice of practising anæsthetists Dr. Fink has rendered a great service.

Bethnal Green Hospital, London, E.2. B. KENTON
Consultant Anæsthetist.

## LACTOSE-FREE DIET IN GALACTOSÆMIA

SIR,—The rigid exclusion of lactose and galactose from the diet is essential in the treatment of children with congenital galactosæmia and much attention has recently been paid to ways of achieving this.[1–4] We have found no reference in the literature, however, to the possibility of lactose ingestion in the form of tablets of commonly used prophylactic or therapeutic agents such as ascorbic acid, and we wish to draw attention to this possible danger.

A baby aged 3 days became jaundiced, and hepatosplenomegaly was discovered. His urine contained a reducing substance, and this, together with a suggestive clinical history with death at ten days in a sibling, made congenital galactosæmia likely. Paper chromatography was used later to identify galactose in the urine. He became ill on the fourth day, and a lactose-free synthetic milk, 'Nutramigen,' was started then, and later changed to 'Mullsoy,' which has been continued to date. There was rapid improvement in his general condition and his melituria disappeared. At three months, however, he ceased to gain weight, and, although quite well with no sugar in his urine, for the next two months his weight was static. At the end of this time it was discovered that the 25-mg. tablets of ascorbic acid which he had been given twice daily since the age of one week each contained 125 mg. of lactose. When this treatment was withdrawn he started to gain satisfactorily, and now at 7 months he appears mentally and physically normal, although still underweight.

It is interesting that he was quite well and his urine sugar-free during the period when he was receiving 250 mg. of lactose daily, and that the refusal to gain weight was the only clinical abnormality. When he was taken off the tablets, however, he started to gain weight and clearly this small amount was exerting an adverse effect upon physical progress. In view of the over-all poor prognosis for mental normality in these cases, it may well be that mental progress was also being adversely affected, although this was not evident. At all events, this case reinforces the view that every effort must be made to prevent the ingestion by these children of lactose, even in small quantities.[4]

Lactose is widely used as a "filler" in tablets, especially where the amount of the active ingredient is small, and these tablets may be used in preparing solutions or drops,[5] so that it would not be safe to use any medicament for these patients without a prior inquiry to the manufacturers. In an emergency, however, such as an acute infection where an antibiotic was indicated, a liquid preparation would presumably be preferable to a tablet.

Radcliffe Infirmary, Oxford. B. D. BOWER
VICTORIA SMALLPEICE.

1. Cox, P. J. N., Pugh, R. J. P. *Brit. med. J.* 1954, ii, 613.
2. Komrower, G. M., Holzel, A. *Ibid*, p. 810.
3. Salt, H. B., Ross, C. A. C., Gerrard, J. W. *Lancet*, 1955, i, 1177.
4. Holzel, A., Komrower, G. M., Schwarz, V. *Ibid*, July 9, 1955, p. 92.

## THE CLIMATE OF DISCOVERY

SIR,—I enjoyed so much reading Prof. Melville Arnott's stimulating and sensible address (Oct. 15) that I was bitterly disappointed to read his last sentence. He may, of course, have been attacking only the "obscurantism which *masquerades* (my italics) under the euphemism of the 'art of medicine,'" but since he has not previously mentioned the art at all, one is left wondering whether he understands its true place.

Medicine, he rightly says, must be a compound of "observation, deduction, and the proof of validity of deduction," but just because we deal with human beings, we cannot make the observations—i.e., collect the data—without applying the art. No-one, I would claim, can teach history-taking as a science, and it is the first and still the most important step in diagnosis. And at the other end of our task, when deductions have been made and their validity proved, our power to influence the patient for his own good depends again on art.

I have seen the scientific physician fail through not knowing what questions to ask, or how to ask them. As a result, I have heard him accused of being too scientific, which is absurd. One cannot be too scientific in medicine, but one can defeat the science by having too little of the art.

London, S.W.1. ROBERT PLATT.

## BARBITURATE POISONING

SIR,—In view of the recent interest in the treatment of barbiturate poisoning, I think the following case is worth recording.

A woman of 82, previously in good health apart from bilateral cataract, was admitted from a ship on which she had been cruising. She had been in deep coma for over four days. The initial shock having been treated, she presented with deep coma and complete areflexia on admission; there was some dehydration but no other adverse factors. She was believed to have taken about 25 tablets of butobarbitone (gr. 1½).

Treatment was started with intravenous fluids, and the foot of the bed was raised. The diagnosis of barbiturate poisoning was confirmed and 'Megimide,' 0·56 g., with 'Daptazole,' 220 mg., in intermittent dosage, were administered intravenously until supplies ran out. There was no apparent response. Further treatment consisted of 30 mg. methylamphetamine ('Methedrine') every hour, and later 60 mg. every hour. The level of coma became gradually less, but it was not until the eleventh day that she was able to speak in response to painful stimuli. Full recovery was not reached until a further three weeks had passed. It was apparently complete and there were plans afoot for another sea voyage in due course!

The points of interest seemed to us to be:

(1) That she should recover from a coma so long and so deep.
(2) That she tolerated such massive doses of methedrine without ill effect (and without any tendency to hypertension).
(3) That recovery was complete, leaving no residual cerebral damage.

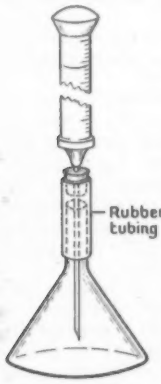
Opinion seemed to be divided over the last point, and we can find no report of cases which do recover, but with cerebral damage related to the depth of coma and its duration, particularly in people of this age. Have such cases occurred?

Royal South Hants Hospital, Southampton. C. A. ROGERSON.

5. Ardley, D. G. Personal communication.

## MODIFICATION OF THE HEAF TEST

SIR,—Dr. Peter Stradling has described (July 30) a dropper for use with the Heaf gun in tuberculin testing. I would like to suggest a simple modification of his apparatus which can be made up easily of parts found in any clinic. The parts required are :




The barrel of a 2-ml. syringe.
No. 2 needle.
Length of $^1/_2$-inch rubber tubing.
Small glass funnel from the stem of which 1 inch has been sawn off.
Rubber cap as found on any rubber-capped bottle.

This apparatus can be disconnected for sterilisation and reassembled in a few seconds. All parts can be boiled. When dropping is taking place, the funnel rests on the arm. When not in use the funnel rests in any antiseptic solution, care being taken that the level of the antiseptic does not reach the needle.

To fill the dropper-barrel, the tuberculin solution is drawn into any sterile syringe and is injected into the nozzle of the barrel after first disconnecting the barrel from the needle.

This apparatus was used with great success in a recent survey of 709 patients.

South Ockendon Hospital, Essex. DAVID DAVIS.

## IDENTIFICATION OF SYRINGES

SIR,—The battery of syringes used for intravenous drugs in anæsthesia today is, to my mind, a potential source of disastrous error. Most anæsthetists use some method of identification such as different sizes of syringe, labelled racks, or spring-clip labels, but objections can be made to all such methods.

Many of these objections can be overcome by the use of coloured plungers to identify the contents of the syringe. Red for Relaxant, Blue for Barbiturate, and Plain for Pethidine are easy to memorise, and Surgical Equipment Supplies Ltd. are making up syringes for me with a band of colour round the neck of the plunger.

West Suffolk General Hospital, Bury St. Edmunds. H. MARCUS BIRD.

## HORMONE TREATMENT OF HÆMORRHAGE

SIR,—I am tempted to write this letter to report a case which may be of unusual interest to both ophthalmologists and physicians, because of the dramatic result.

A woman, aged 74, consulted me in February, 1955. She complained of nausea, vertigo, and visual difficulty. She was unable to see the ground when she walked and always had to be accompanied by someone. In June, 1954, what was said to be a "thrombosis in the left eye" had developed. I am told by Dr. George Frampton that this was probably a hæmorrhage. Dr. Frampton has observed her from time to time, from January, 1955, until now. She had a hæmorrhage about one disc diameter in size in the left macular region and scarring in the region of the right macula. Over a period of six months no change was observed in the condition of the eyes. About a year previously she had had an episode of sudden vaginal hæmorrhage, and about the same time she had had a painful subcutaneous hæmorrhage, the size of a saucer, on the thigh.

Complete neurological investigation had previously been carried out on account of her vertigo, with negative results. The blood picture (including platelets, bleeding-time, and clotting-time) was normal; Ide test negative.

Physical examination was essentially normal apart from the eyes and a blood-pressure of 200/100 mm. Hg. For this she was given 'Serpasil' with a resultant fall to 140/80, at which figure it now remains without any medication.

The patient was seen at about monthly intervals, and in June, 1955, she complained that her vision was deteriorating. On July 1, on the assumption that the hæmorrhagic manifestations might respond to hormone therapy,[1] I prescribed 'Proluton' buccal tablets 10 mg. daily. On July 18 she reported that she thought her vision had improved. She was then instructed to take 10 mg. every second day. On Aug. 4 she was again seen, and by this time her vision had improved remarkably. She was able to see and do things impossible in the past. I could find no sign of the retinal hæmorrhage, and this was confirmed by Dr. Frampton. She has been instructed to continue the proluton 10 mg. every second day. Whereas this patient would always come to see me using a stick and with someone to assist her, she now has gone on holiday alone.

I realise that this one case may have some other explanation and that the patient may yet suffer a relapse, but I feel that in view of the disabling nature of her condition this report is justified.

Johannesburg. ROY MORRIS.

## SEXING NUCLEI

SIR,—To the methods mentioned in your excellent leading article of Sept. 24, we should like to add a technique that has, to the best of our knowledge, not yet received attention or been described as such, and that has proved to us of great practical value—namely, the study of vaginal and urethral smears.

During the routine examination of vaginal smears in our department, we noticed that the sex chromatin was strikingly conspicuous in many squamous-cell nuclei, especially, when œstrogen influence, which results in nuclear shrinking and pykenosis, was not too pronounced. A systematic review of smears—some of them years old—from patients with primary amenorrhœa, enabled us to recognise an unexpected majority of males in a series of Turner syndromes, and to reach a positive diagnosis of "ovarian" agenesis in 3 doubtful cases, since they proved to be genetically male. The final result of this study was 12 Turner syndromes, 10 of them genetic males. Since, we have by the same technique also obtained completely unequivocal results in 6 cases of doubtful sex. Our findings and comments will be published in detail presently.[2]

The sex interpretation of the vaginal smears is extremely simple and demands but little experience, while counting and calculating can be omitted altogether. In a complementary study of oral-mucosa smears, taken from male and female volunteers, and of compared oral and vaginal smears simultaneously obtained from gynæcological patients, the uncontestable superiority of the vaginal smear was clearly demonstrated. In the latter, the number of cells, in which the sex chromatin can be recognised, is much higher, even in the presence of some œstrogenic influence; cumbersome cytoplasmic inclusions are but rarely encountered and the nuclear detail is more clearly visible. Besides, we were pleasantly surprised, when we found out, that the sex chromatin was conspicuous even in the vagina smear drawings and microphotographs of a classical textbook on exfoliative cytology.[3] On the other hand, we have not yet found a cytological description paying much attention to these peculiar chromatin corpuscles.

Urethral smears are also well suited for this kind of study. Although disturbing cytoplasmic inclusions may occur, the nuclei or the urethral-mucosa cells are in most cases clear and vesicular. As will be shown elsewhere, their study can be helpful in cases of male pseudohermaphroditism. Smears from the urogenital sinus in cases of female pseudohermaphroditism and from a very shallow vagina in several instances of vaginal atresia gave equally good results.

Our experience seems to indicate that in biopsies of vaginal mucosa the sex chromatin is as a rule more distinct than in biopsies of the abdominal skin. In the former, the cell nuclei of basal and middle layer appear to be more "eutrophic" and vesicular. We feel that this could be related to the proliferative and desquama-

1. Greene, R., Dalton, K. *Proc. R. Soc. Med.* 1955, **48**, 337.
2. *Ned. Tijdschr. Geneesk.* (in the press).
3. The Cytologic Diagnosis of Cancer. Philadelphia and London; 1950, p. 2.

tive function of the vaginal epithelium. It would in addition explain the superiority of the vaginal over other mucosal smears for the determination of genetic sex as well as for other cytological purposes.

Finally, several fortunate coincidences contribute to the value of the vaginal-smear technique:

(1) Most cases where determining genetic sex is important are seen by the gynæcologist or the obstetrician, who is usually well acquainted with the essentials of technique and interpretation of vaginal cytology.

(2) In cases where the determination of genetic sex is indicated, an adequate vaginal and, eventually, urogenital or urethral smear can easily be obtained.

(3) In these patients, owing to a lack of œstrogen, the desquamating cells are mostly of the basal type, presenting large vesicular nuclei, with very conspicuous sex chromatin. But, in our comparative study, this did not apply to the oral-mucosa smears.

(4) No special technique and no extraordinary skill or experience is wanted, provided the classical fixation and staining method of Papanicolaou has been followed in detail. The very sensitive and elegant Feulgen technique shows the sex chromatin in a somewhat higher proportion of the cell nuclei, but we feel that the Papanicolaou procedure, in addition to being more rapid and more generally used, is anything but inferior in diagnostic value.

We suggest the checking of the sex chromatin as a cytological routine, especially in cases of primary amenorrhœa. Although, for the time being, skin biopsy is still indicated as a valuable control, we believe that in the vast majority of cases, genetic sex can and will be most easily determined simply by the examination of a vaginal smear.

P. J. CARPENTIER
L. A. M. STOLTE
G. P. VISSCHERS.

Department of Obstetrics and Gynæcology, State University, Utrecht, Netherlands.

## ASTHMA, CHRONIC BRONCHITIS, AND EMPHYSEMA

SIR,—The excellent article by Dr. Lister (Oct. 8) presents many stimulating ideas and will help in the approach to therapy of many cases. However, it is probable that the problem presents a somewhat different facet in the comparatively uncontaminated air of the West Country from that seen in the overcrowded industrial areas.

The bronchitis death-rates in 1950–53 per 100,000 males in Plymouth were 74 for those of 45–64 years and 332 for 65–74 age-group, which contrasted with 329 and 1235 for the same age-groups in Salford. This fourfold difference reflects more than allergy and gives hope that preventive measures can do much to rid our community of this scourge. Atmospheric pollution is undoubtedly a major factor, but the present Clean Air Bill omits any reference to the most important pollutant —sulphur. It is to be hoped that Members of Parliament for badly affected areas will see that this is rectified when the Bill comes up for second reading.

Conditions at work, especially in cotton mills, mines, and foundries, serve to swell the total of mortality and morbidity. In all these industries rapid improvement in working conditions is possible and imperative.

The contribution of the cigarette to this national problem must be assessed dispassionately. Most of the patients seen in the early stage of chronic cough are addicts to tobacco, but find tremendous relief if they can be persuaded to abstain completely.

Finally, Sir, treatment facilities have been inadequate. Now, in most regions, beds are becoming available in sanatoria and chest hospitals. It is hoped that many of these will be used for prolonged convalescence and rehabilitation of our pathetic army of chronic coughers.

Clean air will ensure healthy lungs even in the presence of some allergy.

Central Middlesex Hospital, London, N.W.10. HORACE JOULES.

## A DEVICE FOR BLIND PHYSIOTHERAPISTS

SIR,—A research grant from the Royal National Institute for the Blind has enabled a device to be designed and developed whereby a blind physiotherapist can detect degrees of erythema in the skin, whether from a test dose or from a general irradiation, by auditory means. This enables him to administer general ultraviolet light with the same degree of accuracy as his sighted colleague. This instrument has now been approved by a panel of the Chartered Society of Physiotherapy, as has a demonstration of the technique of administration in a pilot group of blind physiotherapy students.

Steps are being taken to provide a course of theoretical and practical instruction in the use of the device by such qualified blind physiotherapists as desire it.

A technical description of the apparatus, which is being manufactured for the R.N.I.B. by Electro Medical Supplies Ltd., was published in the September issue of the *Braille Physiotherapy Journal*.

Royal National Institute for the Blind, School of Physiotherapy, London, W.1. CLIVE SHIELDS
Chief Medical Officer.

## HYDROCORTISONE IN PAINFUL SHOULDER

SIR,—Mr. Murnaghan and Mr. McIntosh (Oct. 15) are to be congratulated on their attempt to perform a controlled trial in a field where so much empiricism exists.

I regret, however, that they apparently ignore the fact that although the exact pathology in many cases must remain open to conjecture adequate examination of the "painful shoulder" may enable the clinician to place the underlying lesion into one or another diagnostic subgroup (such as described by Furlong[1] whom they quote) in which management may differ considerably. To be able to appoint any particular case to one of these subgroups, information must be gained concerning not only the range of active movements but also of passive movements and movements against resistance.

From their statement that "as a rule the pain seems to subside of itself within about two years, leaving various degrees of limitation of movement," Mr. Murnaghan and Mr. McIntosh appear to have considered mainly those cases known to many as the "frozen shoulder"—a group in which all methods of treatment have to date been notoriously unsuccessful, the disorder obstinately following its natural history of eighteen months to two years. It is in cases of local damage to the rotator cuff (traumatic, degenerative, or combined) with evidence of early spread of the local inflammatory response to the adjacent capsule of the shoulder joint or the subacromial bursa that treatment often proves so useful. These lesions appear to have a natural history of three to six months unless maltreated, or unless naturally unfortunate for some reason not understood, when they may progress inexorably to the full picture of "frozen shoulder." Active exercises apart from simple gravity-assisted pendulum exercises may accelerate this train of events in the early case, and Mr. Murnaghan and Mr. McIntosh do not record what type of "active exercises" were prescribed in their series. Only observation over a period of three to four weeks will show whether any case with active involvement of the capsule of the joint is in fact progressing to the "frozen shoulder" syndrome.

I would not expect hydrocortisone to have "any specific action in painful shoulder." The only specific action hydrocortisone possesses at the point of local application is the damping down of local inflammatory response, and therefore in nearly all lesions of the rotator cuff and capsule of the shoulder joint it can be used only as an aid to treatment: the usual application of the basic principles of rest and movement suitable to the particular case must not be forgotten.

Had Mr. Murnaghan and Mr. McIntosh given us more exact information about the type of case they were

1. Furlong, R. *Ann. R. Coll. Surg. Engl.* 1952, **11**, 300.

treating their study could indeed be regarded as "a controlled trial" and their results of the utmost interest. Meanwhile it would be a great pity if other workers in this field were discouraged by their results. A controlled trial dealing with all the varied clinical aspects of the "painful shoulder" is still required.

St. Thomas's Hospital, London, S.E.1. D. R. L. NEWTON.

## FOREIGN BODY IN THE ŒSOPHAGUS

SIR,—The following case illustrates the potential dangers of certain practical jokes.

Mr. A., aged 52, was admitted to Morriston Hospital as an emergency at 1 A.M. on June 19, 1955, complaining of dysphagia and the feeling of "something sticking" behind the upper end of his sternum. Three hours previously he had been drinking at a public-house and a friend had placed a plastic "spider" in his glass of beer. He accidentally swallowed the spider.

On examination, there was no respiratory distress and he was able to localise the foreign body at the level of the upper

Fig. 1.

border of the manubrium sterni. He had vomited once since the incident but no foreign body was seen in the vomit.

No abnormality was found on plain radiography of the neck and thorax. A hold-up of iodised oil following a swallow was demonstrated in the upper part of the œsophagus. A barium-swallow showed the spider's legs (fig. 1).

At œsophagoscopy the foreign body was seen to be lying transversely across the lumen of the œsophagus with the springy legs embedded in the mucosa. On pushing the body of the spider it rotated around the axis of the embedded legs, and was removed with ease (fig. 2).

The dangers of this type of practical joke should be made fully known to the general public.

Fig. 2.

I should like to express my thanks to Mr. C. H. Tanner for permission to publish the case and to Dr. K. Mendl for the radiographs.

Morriston Hospital, Swansea. D. E. STURDY Surgical Registrar.

## DUAL CAUSE OF RAPID DEATH

SIR,—In his interesting article of Sept. 24, Dr. Foster suggests that a reflex rise in blood-pressure following cerebral hæmorrhage may have been responsible for rupture of an aorta already weakened by "mucoid change" of the media. He also cites 3 other cases where a similar sequence of events had probably occurred.

Arteries which have ruptured spontaneously generally show the same morbid changes in the vessel wall as are seen in cases of dissecting aneurysm[1,2] and, as Shennan[3] states, a *sudden* increase in blood-pressure may be sufficient to initiate dissecting aneurysm when the vessel wall is already diseased. I have seen 2 cases which lend further support to Dr. Foster's proposition regarding the order of events. Both were patients with cerebral hæmorrhage dying within 7 and 24 hours respectively of the onset of illness. In the first case a ruptured dissecting aneurysm of the splenic artery and in the second a simple dissecting aneurysm of the right renal artery were found incidentally at necropsy and were evidently of very recent origin. Microscopical examination of the affected vessels showed medial degeneration (increase in metachromatic ground substance and depletion of muscle-fibres) and it seems highly probable that the considerable elevation of the blood-pressure following cerebral hæmorrhage initiated disruption of the already weakened vessel walls.

Pathology Department, Western Infirmary, Glasgow, W.1. A. J. WATSON.

## GRAVES'S DISEASE

SIR,—The suggestion of Dr. Taylor and Dr. Williams (Sept. 10) that Graves was describing phæochromocytoma with transient thyroid enlargement rather than the disease which now bears his name, is of great interest chiefly because it emphasises the similarity of the two disorders. Their differentiation may be difficult, and recently cases[4–9] have been reported where phæochromocytoma has been mistaken for hyperthyroidism and treated either by thyroidectomy or with thyroid depressants. Davies,[9] whose account of such a case is the most recent I have seen, finds it surprising that "in view of the similarity of the two syndromes . . . this diagnostic pitfall has not been more widely published." It should be mentioned that in none of these cases was thyroid enlargement a prominent feature, the diagnosis having been made on other signs and symptoms and, of course, on the elevation of the basal metabolic rate.

Though your correspondents' suggestion appears plausible, a closer examination of Graves's original paper[10] reveals two arguments against it. Firstly, phæochromocytoma is a rare disease and thyroid enlargement, though it may occur more often than has been reported or noticed, is nevertheless a rare complication. It is, therefore, most unlikely that Graves should have encountered, in a short space of time, 3 cases presenting this rare complication of a rare disease—"I have lately seen three cases . . ." Secondly, in the course of his description of these 3 cases, he says: "the size of the

1. Milne, J. A., Graham, J. G., Simpson, J. *Glasg. med. J.* 1950, **31**, 206.
2. Gore, I., Selwert, U. J. *Arch. Path.* 1952, **53**, 131.
3. Shennan, T. *Spec Rep. Ser. med. Res. Coun., Lond.* 1934, no. 193.
4. Beer, E., King, F. H., Prinzmetal, M. *Ann. Surg.* 1937, **106**, 85.
5. McCullagh, E. P., Engel, W. J. *Ibid*, 1942, **116**, 61.
6. Espersen, T., Dahl-Iversen, E. *Acta chir. scand.* 1946, **94**, 271.
7. Hatch, F. N., Richards, V., Spiegl, R. J. *Amer. J. Med.* 1949, **6**, 633.
8. Bartels, E. C., Arnold, W. T. *Lahey Clin. Bull.* 1949, **6**, 132.
9. Davies, J. V. S. A. *Brit. med. J.* 1952, ii, 77.
10. Graves, R. J. *Lond. med. surg. J.* 1835, **7**, 516.

gland *at all times considerably greater than natural* was subject to remarkable variations . . . When the palpitations were violent the gland used notably to swell . . ." (italics inserted). It is clear from this that in these cases a further increase in size occurred in a gland already enlarged. This is common in Graves's disease. According to Zondek,[11] "a characteristic feature of Graves's disease is the liability to changes in the volume of the gland . . ." Furthermore, as far as I am aware, in no case of phæochromocytoma as yet described has a permanent enlargement of the gland been reported.

Though Graves was wrong in attributing the thyroid enlargement to vascular engorgement, his phrases, "an interstitial and sudden effusion into its substance," "the thyroid analogous . . . to the tissues properly called erectile," and "palpitation depending on functional disease of the heart . . . exciting the swollen state of the thyroid," all suggest this; nevertheless, there can be no doubt that he did describe a condition which he considered a clinical entity characterised by thyroid enlargement and palpitation. For this reason and also because of the objections to the only likely alternative, I would say that Graves was describing Graves's disease.

My second objection—namely, that the thyroid enlargement in phæochromocytoma is transient, whereas in Graves's disease it is permanent—would be invalid if it could be shown, as it well might be now that our attention has been directed to this point, that Graves's disease is ushered in by a series of transient enlargements of the gland. If we postulate an irritable or hyperreactive thyroid as the constitutional factor in this disease, then these transient enlargements would represent readily induced reactions to minor emotional stresses, the chemical stimulus being provided by noradrenaline produced by the fluorescing cells of Eränkö.[12] Sooner or later a major stress and, therefore, a more powerful stimulus from the adrenal medulla would bring about an exaggerated response from the thyroid, the boundary line between morbid physiology and morbid anatomy would be crossed, and permanent enlargement of the gland would ensue.

That this is the probable sequence of events is suggested by the second and, to me, the more important part of Graves's paper:

"Another fact well worthy of notice, is that females liable to attacks of palpitations almost invariably complain of a sense of fullness, referred to the throat, and exactly corresponding to the situation of the thyroid. This sensation only continues while the paroxysm of palpitation lasts, and frequently is so urgent as forcibly to attract the patient's notice, who now complains of its inducing a sense of suffocation. Here the interesting question occurs whether this feeling of something that impedes the respiration at the bottom of the throat, during the hysterical fit, and which has been included under the general term *globus hystericus*—the question arises, I say, whether this feeling is always of purely nervous origin. To me it appears probable that it is often induced by the pressure arising from a sudden enlargement of the thyroid, which enlargement subsides as soon as the fit is over. Of this I am certain, that the lump in the throat, of which such females complain, is often exactly referred to the situation of the thyroid: and indeed I have been told by other practitioners, upon the accuracy of whose observations I can rely, that this swelling in the throat of females during the hysteric paroxysm has more than once excited their wonder."

It is among these cases which astonished Graves's colleagues that the occasional case of phæochromocytoma with transient thyroid enlargement would be found. Usually they would be cases of early Graves's disease.

Finally, it is worth recording that the relationship between emotional stress and thyroid enlargement had been noted by observant laymen centuries ago. Though it may seem a far cry from phæochromocytoma to tests for virginity, this paragraph from Havelock Ellis[13] is not irrelevant when we bear in mind that the proceedings of the wedding night might well prove a terrifying ordeal for all true (and unsophisticated) virgins:

"The ancient custom known in classic times, of measuring the neck the day after marriage was frequently practised to ascertain if a girl was or was not a virgin. There were various ways of doing this. One was to measure with a thread the circumference of the bride's neck before she went to bed on the bridal night. If in the morning the same thread would not go round her neck, it was a sure sign that she had lost her virginity during the night. If not she was still a virgin or had been deflowered at an earlier period. Catullus alluded to this custom which still exists or existed until lately in the South of France."

Johannesburg. PERICLES MENOF.

11. Zondek, H. Diseases of the Endocrine Glands. London, 1935.
12. Eränkö, O. *Nature, Lond.* 1955, **175**, 88.
13. Ellis, H. Studies in the Psychology of Sex. Philadelphia, 1928; p. 203.

## Medicine and the Law

### More than Agents

IN 1948, leasehold property near University College Hospital, tenanted by a business firm and purchased by the hospital in 1947 for future extensions, became vested as "endowment property" in the board of governors under the National Health Service Act, 1946. Just before the leases expired in March, 1955, the tenants applied to the county court for a new lease under the Landlord and Tenant Act, 1954. The board as landlords opposed the application on the ground, set out in section 30 (1) (*g*) of the Act of 1954, that "on the termination of the current tenancy the landlord intends to occupy the holding for the purposes . . . of a business to be carried on by him therein . . ." The board had agreed to sell the premises to the Minister of Health when they obtained vacant possession, and urgently needed them for hospital purposes. The tenants contended that as the board intended to occupy the premises, not in their own right, but as agents of the Minister for the Minister's purposes, they had not satisfied the condition in the Act of 1954. The county court judge refused to grant a new lease; and the tenants appealed. The Court of Appeal, by a majority, Lord Justice Hodson dissenting, dismissed the appeal and refused leave to appeal to the House of Lords.

LORD JUSTICE DENNING said that the answer to the question whether the board intended to occupy these premises for the purpose of a business carried on by them depended on the real position of the governors in relation to the Minister under the National Health Service Act, 1946. Under that Act the board was entrusted with the task of managing and controlling the hospital on behalf of the Minister in accordance with such directions as might be given by him. His Lordship could not agree that the board would occupy only as the Minister's agents; for the board of governors of a teaching hospital were in a very superior position to that of an ordinary agent. They were entrusted with the task of running the hospital themselves. The Minister could not take that task out of their hands and run it himself. They were in such a responsible position that they were the occupiers of the hospital. Their occupation was at least as high as that of the master of a ship or a bailiff who could bring an action of trespass in their own names, whereas a mere servant could do no such thing. On the definition of "business" in the Act it was plain that the governors intended to occupy these premises for the purposes of the activity carried on by them. He would accordingly dismiss the appeal.

LORD JUSTICE HODSON, dissenting, said that the Minister had power under section 57 of the Act of 1954 to prevent a new lease being granted where premises were needed for hospital purposes. He had not used that power; and the question therefore was whether anyone had taken the right steps to prevent the tenants from getting a new lease. His Lordship could not see any answer to the tenants' argument that the board were agents of the Minister. The language of the National Health Service Act, and particularly of section 13, supported the view that the board were not, in exercising their powers under the Act—extensive and important though those powers were—acting as principals. If they

were merely agents, the intended occupation was not that of the board but of the Minister, and the business to be carried on was that of the Minister and not of the Board in their own right. He would have allowed the appeal.

LORD JUSTICE MORRIS said that under the Act of 1946 the board, though subject to the Minister's directions, had a very special position. The powers delegated to them were so ample that it was proper to say that they were the occupiers of the hospital for the discharge of their duties. He would dismiss the appeal.

Hills (Patents) Ltd. *v.* Governors of University College Hospital.—*Court of Appeal:* Denning, Hodson, and Morris, *L.JJ.*: Oct. 10, 1955. Counsel and Solicitors: Roy Wilson, Q.C., and Adrian Hamilton (Underwood & Co.); Tristram Beresford, Q.C., and R. H. Moylan (Pennington & Sons).

M. M. HULL
Barrister-at-Law.

# Public Health

## Rehabilitating the Problem Family

COMMENTING last year on the case of a mother who was sentenced to six months' imprisonment for neglecting her 6 children,[1] we referred to various bodies—notably the Family Service Units and three homes—whose object is to save the problem family from disruption. Of the homes which offer the mother training in mothercraft and housekeeping, Spofforth Hall, near Harrogate, was provided by the Elizabeth Fry Memorial Trust, which now reports on the third year's work.[2]

When Spofforth Hall first opened, most of the families came on the recommendation of medical officers of health; and the report says: "Families who came in this way were those whose home conditions were such that public action might need to be taken to separate the children from their parents unless timely and sympathetic help could be given." In 1953–54, medical officers of health sent 28 families, and only 3 were sent as the result of probation orders. In April of last year, however, Spofforth Hall was approved by the Home Office as a home to which mothers convicted of neglecting their children could be sent as a condition of probation orders, and this has changed the type of family admitted; last year no fewer than 10 families were sent by the courts, and the number sent by medical officers of health fell to 19. The report adds: "Whilst the Committee is glad to be able to provide a constructive alternative to a prison sentence for mothers convicted of neglect, they feel that greater effort should be made to offer help before this stage is reached." This change has also been financially inconvenient, because "payments for mothers and children who came to Spofforth Hall as a condition of a probation order are substantially less than those paid by health authorities, and very much below the actual cost of maintaining the family."

There is accommodation for 10 families at Spofforth Hall, and the average length of stay is about two months; mothers on probation must not leave under four months. Fathers have stayed repeatedly with their families, and the warden has been able to give encouragement and advice to them, as well as to each mother.

The committee says that "so far, all the families who have been to Spofforth Hall are, with varying degrees of success, maintaining their own homes and families," but it emphasises the need for coöperation from the local authorities in providing reasonable accommodation when the families leave. The good work is liable to be completely undone if the mother has to return to a squalid home, where she is faced with all the problems which previously submerged her.

Although local authorities contribute in keeping the families at Spofforth Hall, a large proportion of the expenses of this excellent work is met by bursaries, donations, and subscriptions.

In considering how families can be prevented from breaking up, the Association of Children's Officers[3] makes three main points. Better education for maladjusted and educationally subnormal children would reduce the number of "inadequate and irresponsible adults" and "break the vicious circle whereby one generation of deprived children begets the next." Secondly, the health visitor and education welfare officer, who can now call on the health and education services, should be able to enlist the help of any of the social services (for instance, the housing authority) in times of crisis in their families. Finally, when the family has gone "from bad to worse" and its disruption seems imminent, the social worker should accept responsibility for what is beyond its ability. Children's officers have already proved the value of this family case-work, and the memorandum can say that "the number of children in public care is declining and the upward trend of the number of children coming into care has been arrested."

1. *Lancet*, 1954, ii, 537.
2. Third annual report of the Elizabeth Fry Memorial Trust. To be had from the secretary of the Trust, Beverley House, Shipton Road, York.
3. Helping Families. Published by the Association of Children's Officers. Copies can be obtained, post free, for 6*d.* each from A. S. N. Allison, 47, Full Street, Derby.

## Poliomyelitis

Uncorrected notifications of poliomyelitis in England and Wales in the week ended Oct. 8 (40th week) showed the largest decrease so far this year, suggesting that the peak of the epidemic has been passed. The figures were (39th week in parentheses): paralytic 186 (207), non-paralytic 164 (180), total 350 (387). Regionally the figures decreased in all regions except the North Midland and South Western regions and in Wales. In Greater London (excluding London county) Willesden notified a further 6 cases and Enfield 4. No other boroughs or districts notified more than 3 cases. The following figures give the total uncorrected notifications in the 40th week during the past six years (percentage of paralytic cases in parentheses): 1950, 353 (68·3%); 1951, 96 (58·3%); 1952, 155 (66·6%); 1953, 176 (60·8%); 1954, 72 (62·5%); 1955, 350 (53·1%). The proportion of non-paralytic cases in England and Wales dropped still further to more normal proportions, but in 17 counties non-paralytic cases were in excess of paralytic. In 1955 so far the proportion of non-paralytic cases has been approximately 46·2% of the total. The corresponding figures in the preceding four years were: 1951, 41·5%; 1952, 29·8%; 1953, 34·6%; 1954, 32·8%.

## Second Quarter in Eire

Births registered in Eire during the second quarter of this year[1] numbered 16,639, representing a birth-rate of 22·9 per 1000 population, which was 0·9 above the rate for the second quarter of 1954. Deaths totalled 9699, which is equivalent to an annual death-rate of 13·3 per 1000 population—1·2 above the corresponding quarter last year. Deaths from all forms of tuberculosis numbered 236—a rate of 0·32 per 1000 population; the corresponding rate in 1954 was 0·4. The maternal-mortality rate was 1·1 per 1000 births registered, as against 1·0 in the second quarter last year. There were 595 deaths of infants—an infant-mortality rate of 36 per 1000 registered births, which was the same as last year.

## Orange Drinks

Dr. D. Livingstone, speaking on behalf of the Leamington health department on Sept. 16,[2] said that sales of orange-juice obtainable under the National Health Service had fallen by rather more than 10% in the past few months, and there had been a corresponding boom in the sale of proprietary orange beverages, which were often delivered with the milk. Many mothers might be turning to the proprietary drinks believing that these contained no less vitamin C. He continued: "Labels on the bottles describe the dairy-sold variety as a 'fresh orange drink' and I am told that one milkman asked a mother whether she would like fresh orange-juice delivered. This is misleading, to say the least."

Dr. Livingstone informs us that the concentrated product obtainable under the N.H.S. was found to contain 62 mg. of vitamin C per fluid oz., whereas a beverage labelled "fresh orange drink" contained only 0·06 mg. per fluid oz. There is, he says, no suggestion that the labels on the bottles misrepresent the vitamin content, but it is not made clear that the drink is a pasteurised diluted solution of orange-juice.

1. Quarterly Return of the Marriages, Births, and Deaths. Obtainable from the Government Publication Sales Office, G.P.O. Arcade, Dublin. Pp. 31. 6*d.*
2. *Birmingham Post*, Sept. 17, 1955.

# Obituary

## MARGARET NELSON JACKSON

B.M. Oxfd, D.P.M.

ON Monday of last week Margaret Jackson was working as usual in our office. For more than fifteen years she has had a large share in forming and expressing the opinions of this journal on a wide range of subjects and we believe her contribution was as useful as it was skilful. But we cannot reliably assess it: we can do no more than indicate why we shall miss our colleague and our friend.

Formerly slight and aquiline, at 54 she was a short, solid, almost portly, person with a liking for gay and elegant clothes. She had been, she told us, an anxious, blushing, and often miserable girl, but the years had made her more equable; and, though she could still be indignant and occasionally sad, she was usually both so kind and so cheerful as to be very reassuring and encouraging company. These qualities of character are happily not so uncommon as to be highly remarkable in themselves; but Margaret Jackson also had a good brain, artistic talents, and much determination. She had a high tolerance for people but a low tolerance for unsatisfactory institutions. At her worst she wrote well and at her best superbly. Her drawings were charming, she was a beautiful raconteur, and she loved acting and producing plays. The sometimes passionate humanitarian feeling she showed was not something given by education or learnt from books or clergymen: it was her own. In considering the effort she put into medical reforms and the sense of proportion she showed as a reformer it is not irrelevant to recall that her father was a Lancashire comedian and entertainer, with the sensibility and sympathy this implies. She was early taught to laugh *with* people, and though her own humour was exquisite she responded readily over a broad spectrum.

[Lafayette

From Nelson Jackson's home in Barnes, which was pleasantly full of sketches by fellow members of the Savage Club, his daughter attended St. Paul's School for Girls, where she had won a scholarship. Then, like her brother, L. N. Jackson of Crediton, she decided on medicine and went to Oxford. From Somerville College she came back to London for her clinical work, and in 1926 she graduated from Charing Cross Hospital, where she became house-physician. The spirit of adventure took her to Egypt where she was medical superintendent of the Lady Cromer Dispensary in Cairo, with the care of innumerable sick children. After her return to England she made her first firm contact with this office by serving as secretary of the Lancet Commission on Nursing, with Mrs. Kettle, the hon. secretary, as her chief. But at this time there was no opening for her on our staff, and she returned to hospital work, first at a private mental hospital and then, for six years, at the Fountain Hospital where she had charge of mental defectives. These years were particularly fruitful and formative.

When she first went to the Fountain she was depressed by the sight of the children, for they did not look like ordinary children. They looked odd; and many had physical handicaps which made them awkward, lame, or clumsy. But by the end of the first week she recognised them as full of character and interest and as different from each other as any other children. Though their minds were not very bright "they were active and gay, glad to use what wits they had, and with a tremendous gift for enjoying small pleasures and joining in whatever fun was going." Soon she began to use her inherited talent for stage-craft to provide more of these small pleasures for them and to allow them to develop their talents. They loved music; many had a good sense of rhythm; and they were unselfconscious with an audience. They enjoyed singing and dancing and action games, and she organised little concerts and little plays which pleased both them and their relations. She was able to do so much for them because she appreciated them as people. Many of her patients (she often pointed out) were really much nicer people than the rest of us—affectionate, good-humoured and generous, ready to please and be pleased. Did we not in the outside world, she sometimes asked, over-value intelligence and brisk efficiency?

She was interested in the nurses as well as the patients. In the early days they had helped her to see their patients as children and not as sad cases, and she recognised the value of their work. As one professional woman to another she offered them her friendship and her help. The born nurse who was not good at passing exams found her a lucid coach who could explain anatomy and physiology clearly and simply and show its practical applications.

But her interest did not stop at their work. Accustomed to use her own leisure constructively—"all leisure corrupts and absolute leisure corrupts absolutely," she once said—she encouraged their perhaps unsuspected interest in reading, music, and dressmaking. Much of this was done through her amateur dramatic society. Before the war the Fountain pantomimes were winning more than local fame. Written, produced, and mounted by Dr. Jackson, they successfully disrupted the routine of the hospital for several months of the year. In turn these opportunities for producing and acting stimulated her, and in these years and at the beginning of the war she wrote several plays.

An entertaining murder play reflected the atmosphere, if not the practice, of a hospital. *Date with an Angel*, perhaps her most successful, was acted by an amateur company in Buckinghamshire during the war and may be done again in Essex. Amateur dramatics at the Fountain became so thriving that Dr. Jackson and her team decided to venture out of the hospital and start an amateur company in South London. Enterprising and resourceful, she bought a roomy barge for the club headquarters; but the outbreak of war put an end to the enterprise, and the *Sonia* had to be broken up at her moorings.

To the beginning of this period (1936) belongs her attractive book on the history of children's dress, entitled *What They Wore* and embellished by her brother's verses. Another book in which she collaborated is one of the best popular manuals of medicine—*Everyman in Health and Sickness*, written with Harry Roberts.

Her entry to medical journalism began when she started to help Egbert Morland with his little monthly, *Maternity and Child Welfare*; and in the summer of 1940 he brought her to *The Lancet*, which badly needed aid. The time was an awkward one; but the length and detail of a dramatic criticism which she wrote during June of that year suggest—not quite incorrectly—that she thought games of bowls ultimately more important than Spanish Armadas. Rather more topically she had just produced, under Morland's auspices, what was described as "An Aylesbury Broadside" in which the case for family allowances was very agreeably presented. But unfortunately *The Lancet* at Aylesbury had a very small staff in a very small room; and Margaret Jackson's racehorse pen had to be heavily harnessed for the duller routine duties. It did its utmost; but truth to tell she never became a really good subeditor. When it was a question of reducing an interesting article of ten columns to a still more interesting one of five, she was excellent; and it was incidentally impressive to see how much knowledge of clinical medicine she possessed and retained. But Margaret Jackson lacked the obsessional interest in detail which is necessary if a journal is to give its pages a reasonably consistent appearance. Nor had she the qualities of a supervisory editor: for her refusal to be swamped by routine went with a certain vagueness about getting next week's issue to press, about what we said a fortnight ago, and even about her luncheon engage-

ments. On the other hand, she was a most able reporter, who at meetings on all sorts of subjects could write (in long hand) a report acceptable alike to speaker and reader; and she was the ideal person to send to any hospital, medical school, or other organisation which wanted people to know about something new it was attempting. Above all, however, she was a brilliant writer of editorials, capable of picking up the dullest report and transmuting it into an exciting leader—as the fairy godmother turns the frog into a prince. There was a danger admittedly that, because of her abundant interest in almost anything, the prince would prove to be triplets; but this was a risk any editor would have gladly run. Her range was such that her editorials on mind and consciousness were on the highest level of scientific journalism, while her utterance on the perils of bicycling was read to his boys by the headmaster of a prep school.

Without this artistry she could not have written so frequently, over the years, on the subjects on which she felt so keenly—especially the improvement of nursing, on the care of the tuberculous, of old people, and of mental patients, and on delinquency and prison reform. These subjects, and others of equal importance, can easily be made tedious by repetition; but Margaret Jackson perpetually found fresh things to say—partly because she cared deeply and partly because her mind was so well stocked and so lively. In her father's household (she used to say) jokes came *first*; and as a serious journalist it had been painful for her to learn that manner must be secondary to matter. But the laughter and the imagery still came through, even if quite often they got no further than the editor's table. The other day a draft leader on certification of mental disorders remarked of a certain procedure that it would have made all the difference to King Lear on the night of the storm. "Better out" she said. . . . "Ah well." Nobody could write better on rehabilitation, and if she had had her way this inherently boring word would long since have been superseded by one more Anglo-Saxon. Like the late Sir Edmund Spriggs, she introduced and propagated the word "reable" as a substitute for "rehabilitate," and some may remember her ingenious propagandist verses on "Able Seaman Able."[1]

As for the things she wanted to see done, she seemed to us to be generally talking very good sense. Like her namesake, she knew when to turn a blind eye; and her refusal to see the difficulties in the foreground often gave her a clear view of the project on the horizon. "But that's merely an economic problem. Surely there could be no difficulty in solving that?" she once said; and this seeming imperception often served to make clear to others that an apparent impossibility was in fact not impossible but only expensive in time, effort, or money. She was very far from being the vague or woolly-minded reformer. Her ideas at first might not always seem practical, but they were always clear cut, and she was an acute, if sympathetic, critic of the ideas of others, especially when they were ill expressed, confused, and pretentious. "I haven't been able to understand it yet" she said of a memorandum; "it's written in baronial Scotch." Her own style was simple; but this was deceptive; for, though she wrote fluently, she only began to write after hours of mental preparation: as she sewed, cooked, or gardened—she enjoyed all these occupations—she would be turning over the opening paragraphs of an article in her mind. Because her ideas were so lucidly expressed, the careless reader might underestimate them. To illustrate a point, she often used a homely metaphor, an everyday allusion, or a frank joke; and she sometimes ran the risk of not being taken seriously. But what she wrote stayed in the memory and she was probably right in her belief that "it's always our lightest word that has any effect."

For a leader-writer, of course, there must be bounds to originality. But fortunately her letters, at least, escaped any kind of editing. Though they may sometimes have surprised the recipients, they were often enchanting—those to her godchildren on their joint official birthday on Midsummer Day for example. "It is perfectly safe," she remarked, "to give any advice to children. They never take it." Of recent years our departing secretaries have usually had a very pretty Jackson poem with their handbags; "In England Now" has been brightened by the vicissitudes of her cats; she has done some broadcasting; and various national bodies, including UFAW, a Ministry, and the Mental Health Research Fund have had her help in persuading the public into something it ought to be doing. For a long time her health has had ominous features; but she always paid the least possible attention to disabilities, and they did not prevent her living an arduous and complex life involving a lot of motor-driving—the kind of life which she presumably preferred since she continued it in her holidays. In the intervals she made charming homes and gardens successively in most of the Home Counties, and visitors found that her cooking almost equalled her conversation. As if all this were not enough, her friends might hope to be startled at Christmas by the arrival of (let us say) a scrapbook made specially for them, or some objet-d'art such as her admired Florence Nightingale rendered in limpet shells. Whatever she made would be a treasure.

In this office for a long time to come we shall keep on remembering wise things and funny things that she said. Some were for internal consumption—such as her elegant comment on a contribution which does not seem to have carried full conviction:

"Like a heron in the twilight, this seems to skim obscurely over the surface of a lot of deep water."

But on the subjects nearest her heart much of what she had to say has been shared with our readers; and this makes us think it likely that, though Margaret Jackson will never be classed among the famous reformers, she has in fact done a great deal to enlarge the thoughts and sympathies of others besides ourselves.

1. *Lancet*, 1945, i, 503.

## JAMES MARTIN BEATTIE

**M.A. N.Z., M.D. Edin., D.Sc. N.U.I.**

Dr. J. M. Beattie, emeritus professor of bacteriology, in the University of Liverpool, died on Oct. 12. He was 87 years of age, but he is still widely remembered as an outstanding teacher.

He was born in 1868, the son of William Beattie of Alexandra, New Zealand, and after graduating M.A. with first-class honours at Otago University, he came to Edinburgh to study medicine. In 1894 he graduated M.B., again with first-class honours. He continued his studies at University College, London, and in 1900 he was awarded a gold medal for his M.D. thesis at the University of Edinburgh. From 1901 to 1907 he held the post of senior assistant to the professor of pathology and lecturer in pathological bacteriology at Edinburgh. O. H. W., who attended his classes, confirms that Beattie was already an excellent teacher.

"His description of the microscopic appearances of sections of pathological tissue, as we looked at a section under the microscope, was lucid and impressive. Histopathology could not be better taught than the way in which he did it. His teaching of bacteriology was fascinating and I well remember the thrill the class had when on one occasion we were shown a culture and stained slides of a new organism that had been brought over from Paris. It was called the *Micrococcus neoformans* and was supposed to be the cause of carcinoma. Unfortunately the cause of cancer was not to be so easily revealed. Later when I reminded Beattie of the incident, he said that he had soon come to the conclusion that the organism from France was nothing more noteworthy than the *Staphylococcus albus*. My contemporaries will remember that he was pathological editor of Choyce's *System of Surgery*, a book that in its day was read by most aspirants to higher degrees in surgery. We students greatly admired his quiet charm and had the greatest respect for his integrity. He stood high in our affection."

During these Edinburgh years he published several papers on the bacteriology of rheumatic fever and began his collaboration with the late W. E. Carnegie Dickson on their book on pathology. The volume on general pathology first appeared in 1908 and the volume on special pathology a year later. The two were later combined to form the *Textbook of Pathology* that for many years was the standard work in pathology in this country.

In 1907 Beattie was appointed to the chair of pathology and bacteriology at Sheffield and during the five years that he held that appointment he was also dean of the medical faculty. In 1912 he accepted the chair of bacteriology in the University of Liverpool, and he held this appointment until he retired in 1934. T. Ll. H., who was both an undergraduate and postgraduate student of his at Liverpool, writes:

"Beattie made his lectures vividly interesting, but it was in the practical laboratory work, especially with postgraduate and D.P.H. students, that he was at his best. Here his courteous and kindly personality were used to good effect in instilling enthusiasm for a rapidly developing subject into his students, while always ensuring the need for meticulous care and accuracy in the work. His spare white-coated figure moving from bench to bench was a joy to see and his approach was regarded by all as a pleasurable interlude in the laboratory routine. A careful, painstaking, honest worker himself, he inevitably left his imprint on those working with him and gave them a firm foundation on which to build in the future."

In Liverpool Beattie continued his studies on the causal relation of streptococci to acute rheumatic disease and became interested in the pathology of the dust diseases and their relation to tuberculosis. His Liverpool chair carried with it the duties of city bacteriologist and these turned his attention to public-health bacteriology. His later papers dealt with bacteriological diagnosis of anthrax, cerebrospinal meningitis, tuberculosis due to milk, sterilisation of milk, bacteriology of water-supplies, and similar topics. In recognition of this part of his work in 1933 the National University of Ireland conferred on him an honorary D.SC. in public health. Though he made considerable contributions to bacteriology in its relation to public health, it is perhaps his share in the *Textbook of Pathology* that will ensure his place among our eminent pathologists. In his retirement he gave much time and care to the revision of later editions of this book, the fifth of which appeared in 1948.

A year after his retirement from the University of Liverpool he was invited to take charge of the department of pathology in Aberdeen during the illness of the late Professor Shennan. Beattie thoroughly enjoyed this return to teaching. An Aberdeen colleague recalls his popularity among his foster students.

"He was a very good teacher; his lectures were clear, simple, and concise, and although with undergraduates he may have been rather dogmatic his teaching to postgraduates was thorough, discursive, and stimulating. His tall, lean slightly stooping figure rather belied a very warm nature of which a most engaging chuckle gave frequent outward, expression. His was a many-sided likeable personality and he enjoyed a very happy family life."

Professor Beattie married Margaret, second daughter of the late Thomas Kettle of Kilmarnock. She survives him with a son and a daughter. The son is a surgeon on the staff of the medical school of Liverpool University.

## ALEXANDER LIVINGSTON

**M.B., M.D.S. Lpool**

Dr. Alexander Livingston, formerly sub-dean of King's College Hospital Dental School, London, and later principal of the Queensland College of Dentistry, died in Oxford on Sept. 28 at the age of 61.

He was born in Glasgow in 1894, and was educated at Wellington High School, near Liverpool, and at Liverpool University. Although lame from childhood, he enlisted in 1914 for special service with the Royal Engineers in connection with wireless signalling. He returned to Liverpool in 1916 to finish his training and he took the B.D.S. in 1918 and was appointed dental surgeon to the Liverpool Royal Children's Infirmary. He proceeded to the M.D.S. degree in 1919, and the M.B. two years later.

Livingston became a member of the committee appointed by the British Dental Association in 1922 on diet and its relation to the teeth, and the subject remained his main interest throughout his life. The following year he was appointed sub-dean and director of dental studies at the new dental school of King's College Hospital. He organised the new school with great energy and originality of mind, and by 1931 it was one of the most advanced of its kind. He was also lecturer in dental surgery and pathology in the University of London, and in 1927 he was appointed consulting dental surgeon to the London County Council, and was medical officer for the council's sixty-three children's dental treatment centres. His publications in these years included reports on his research into the incidence and cause of dental caries, and a handbook of *Dental Histology* (1929).

In 1931 he became principal of the new Brisbane Dental Hospital and of the Queensland College of Dentistry in the University of Queensland. Together these posts gave scope to his gifts as lecturer, teacher, and organiser, and he took a large part in designing the new dental hospital at Brisbane. He was examiner to the Universities of Queensland and Melbourne, and, as a result of his work on cancer of the mouth, he was invited to become a member of the advisory medical committee of the Queensland Cancer Trust.

In 1934 he returned to England, and to private practice, and at first settled in Southampton, where his interest in research and in dental administration persisted, though his work was often interrupted by ill health. He published his observations on diet in relation to gingivitis in 1945.

His last years were spent in Oxford.

A colleague writes: "Apart from his almost international outlook on dentistry, Dr. Livingston maintained a keen interest in local affairs, in his old students, and in much else besides: he had a wide scientific and humanitarian knowledge; he was a competent model engineer, a lover of birds, of books, and music, and a gardener; and his fondness for painting in oils tiny glimpses of his native land gave, and gives, pleasure to many."

He married in 1926 Miss Margaret Aubrey Edwards, who survives him with a son and a daughter.

## LEWIS CHARLES THOMSON

**M.B., Ph.D., D.Sc. Lond.**

Dr. L. C. Thomson, director of group research in the physiology of vision under the Medical Research Council, died on Oct. 10 at the age of 42.

Educated at Sherborne and Guy's Hospital, he graduated M.B. in 1938. In 1940 he joined the teaching staff of the anatomical department at Guy's, but moved two years later to the physiological department where he was assistant lecturer until 1947. During the latter part of this period he worked with W. D. Wright at Imperial College on problems of colour vision. Because of his success in this field Prof. Hamilton Hartridge invited him to join the newly formed vision research unit of the Medical Research Council at the Institute of Ophthalmology. On Hartridge's retirement in 1951 this unit was reconstituted as the council's group for research in the physiology of vision with Thomson at its head. In this position he was triumphantly successful and during the last four years the group has become a nucleus for much of the most active research into the problems of visual physiology to be carried out in this country. In 1947 Thomson was one of the small unofficial group which organised the extremely successful International Conference on Colour Vision held in Cambridge and he was chairman of the colour group of the Physical Society from 1953 to 1955 and a member of the joint committee on lighting and vision of the Medical Research Council and the Department of Scientific and Industrial Research. He was Ettles Memorial Lecturer for 1955, and his general writings on vision included a useful review on colour perception published in *Ophthalmic Literature* in 1952 and chapters in the second edition of Murray's *Colour*.

A colleague writes: "Undoubtedly Thomson's most important work was the series of investigations he made on colour sensitivity, using for stimulation, retinal fields subtending 15 to 20 minutes of arc as opposed to the more usual 1 or 2 degrees. By this means he showed that the presence of the colour-sensitive retinal mechanisms presumed to exist on the basis of colour-mixture data could be demonstrated under conditions which had hitherto suggested homogeneous activity. These results are of fundamental importance in colour-vision theory. His ability as an organiser was exceptional, and unlike many able administrators he was also unusually kindly and his even temper and unruffled good humour in the face of difficulties made him an extremely pleasant colleague."

Dr. Thomson leaves a widow and two sons both still at school.

## Diary of the Week

OCT. 23 TO 29

### Monday, 24th

UNIVERSITY COLLEGE, Gower Street, W.C.1
5 P.M. Prof. F. B. Straub (Budapest): Synthesis of Amylase in Cell-free Systems.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.2
5 P.M. Prof. B. Mukopadhya: The Rôle of Excisional Surgery in the Treatment of Bone and Joint Tuberculosis.

POSTGRADUATE MEDICAL SCHOOL OF LONDON, Ducane Road, W.12
4 P.M. Dr. J. Pepys: Current Views on Bronchial Asthma.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
5.30 P.M. *Odontology.* Prof. H. H. Stones: Facial Pain. (Presidential address.)

MANCHESTER MEDICAL SOCIETY
9 P.M. (Medical School, University) *General Practice.* Dr. Richard Asher: Things Are Not What They Seem.

### Tuesday, 25th

ROYAL SOCIETY OF MEDICINE
8 P.M. *Medicine.* Dr. G. E. Beaumont: The Clinical Approach. (Presidential address.)

ST. MARY'S HOSPITAL MEDICAL SCHOOL, Paddington, W.2
5 P.M. Mr. Howard C. Hanley: Urological Problems during Pregnancy.

WEST LONDON HOSPITAL MEDICAL SCHOOL
5.30 P.M. (Royal College of Surgeons.) Dr. Russell Fraser: Tests of Thyroid Function. (Alex Simpson Smith lecture.)

INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
3 P.M. (Chelsea Hospital for Women, S.W.3.) Mr. F. C. Dwyer: Backache.

INSTITUTE OF NEUROLOGY
5.30 P.M. (National Hospital, Queen Square, W.C.1.) Dr. J. St. C. Elkington: Headache.

INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5.30 P.M. Dr. O. L. S. Scott: Systematised Nævi.

### Wednesday, 26th

ROYAL COLLEGE OF SURGEONS OF ENGLAND
5 P.M. Dr. J. J. Stevenson: Studies of the Movements of the Urinary Tract in Health and Disease as shown by the Image Intensifier. (Film.)

ROYAL SOCIETY OF MEDICINE
5 P.M. *Endocrinology.* Dr. A. C. Crooke: Measurement of Pituitary Function. (Presidential address.)

POSTGRADUATE MEDICAL SCHOOL OF LONDON
2 P.M. Prof. N. H. Martin: Plasma Proteins.

INSTITUTE OF DISEASES OF THE CHEST, Brompton Hospital, S.W.3
5 P.M. Dr. F. H. Young: Pathogenesis of Tuberculosis.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. R. W. Riddell: Diagnosis of Ringworm Infection.

ST. MARY'S HOSPITAL
5 P.M. Prof. John Squire: The Nephrotic Patient.

ST. MARYLEBONE HOSPITAL FOR PSYCHIATRY AND CHILD GUIDANCE, 48, Cosway Street, N.W.1
5.30 P.M. Dr. J. Flind: The Psychosomatic Syndromes.

RENAL ASSOCIATION, 41, Portland Place, W.1
4.30 P.M. Short papers.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, W.1
3.30 P.M. Dr. J. A. Dudgeon: Recent Advances in the Control of Poliomyelitis.

BIRMINGHAM MEDICAL INSTITUTE, 134, Great Charles Street, 3
8 P.M. *Psychiatry.* Prof. R. W. Russell, PH.D.: Some Effects of Certain "Biochemical Lesions" on Behaviour.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS, 242, St. Vincent Street, Glasgow, C.2
5 P.M. Dr. R. L. Richards: Peripheral Vascular Disease—The Arteries.

### Thursday, 27th

ROYAL COLLEGE OF SURGEONS OF ENGLAND
5 P.M. Prof. K. F. Russell: John Browne—1642–1702. (Thomas Vicary lecture.)

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (Senate House, University of London, W.C.1.) Sir Wilfrid Le Gros Clark, F.R.S.: Hypothesis and Speculation in Scientific Research. (First of fifteen lectures on the Scientific Basis of Medicine.)

UNIVERSITY COLLEGE
5 P.M. Professor Straub: Mechanism of Active Transport of Potassium in the Human Erythrocyte.

ROYAL SOCIETY OF MEDICINE
8 P.M. *Urology.* Mr. David Band: Management of Genito-urinary Tuberculosis in a Special Hospital. (Presidential address.)

NUFFIELD ORTHOPÆDIC CENTRE, Wingfield-Morris Orthopædic Hospital, Oxford
8.30 P.M. Prof. C. D. O'Malley: Contributions toward the Discovery of the Circulation of the Blood in the 16th Century.

LIVERPOOL MEDICAL INSTITUTION, 114, Mount Pleasant, 3
8 P.M. Dr. D. Lehane, Dr. M. McCarthy, Dr C. A. St. Hill: The Uses and Abuses of Blood.

UNIVERSITY OF ST. ANDREWS, Queen's College, Small's Wynd, Dundee
5 P.M. Mr. D. J. Browne: Classification and Treatment of Congenital Deformities.

### Friday, 28th

ROYAL SOCIETY OF MEDICINE
5 P.M. *Pædiatrics.* Dr. J. Vernon Braithwaite: Problems Connected with Enuresis. (Presidential address.)

POSTGRADUATE MEDICAL SCHOOL OF LONDON
2 P.M. Mr. J. Swinney: Hydronephrosis.

UNIVERSITY OF EDINBURGH, University New Buildings, Teviot Place, 8
5 P.M. Sir William Macarthur: History of Malaria.

### Saturday, 29th

INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
11.15 A.M. (Hammersmith Hospital.) Prof. A. S. Duncan: Vulvitis and Vaginal Discharge.

INSTITUTE OF ORTHOPÆDICS
10.30 A.M. (Mount Vernon Hospital.) Mr. R. L. G. Dawson: Plastic Surgery in Orthopædics.

## Appointments

BARRON, D. W., M.A. Belf., F.F.A.R.C.S.: anæsthetist at hospitals managed by the S. Tyrone, S. Armagh, and St. Luke's H.M.C.

GARRETT, M. J., M.B. N.U.I., D.M.R.T.: whole-time asst. radio-therapist, Liverpool Radium Institute.

HOWARD, A. C., M.D. Lond: M.O.H., Wem, Ellesmere, and Whitchurch.

MACKEY, H. M., M.R.C.S.: appointed factory doctor, Stamford, Lincoln.

WILLIAMS, H. O., M.CH.ORTH. Lpool, F.R.C.S.: part-time consultant orthopædic surgeon, Whiston, Widnes Accident, and Rainhill Hospitals.

**South-Western Regional Hospital Board:**

AKEHURST, A. C., M.B. Lond., F.R.C.S.: senior surgical registrar, Exeter clinical area and United Bristol Hospitals.

LEIGH, H. I., M.B. Brist.: surgical registrar, Taunton and Somerset Hospital.

SEAGER, C. P., M.B., B.SC. Wales, D.P.M.: senior psychiatric registrar, Bristol Mental Hospitals.

**The Hospital for Sick Children, Great Ormond Street, London:**

EVANS, BEATRICE M., M.B. Lond., D.A.: resident anæsthetist, Tadworth Court.

HAAS, LEONARD, M.A., M.D. Camb., M.R.C.P., D.C.H.: asst. medical registrar.

HOLBOROW, C. A., M.A., M.B. Camb., D.L.O.: senior registrar to the E.N.T. department.

RHODES, ELLEN L., M.B. Leeds, D.C.H.: house-surgeon, orthopædic and plastic department.

SOMERS, K., M.B. Witw'srand, M.R.C.P.: house-physician.

## Births, Marriages, and Deaths

### BIRTHS

DIGGORY.—On Oct. 11, at The Old Court Clinic, Hanger Lane, Ealing, to Patricia and Peter Diggory of 10, Campden Hill Square, London, W.8, a daughter.

### MARRIAGES

MONCRIEFF—WEDMORE.—On Oct. 15, quietly at Beckenham, Alan Moncrieff, C.B.E., M.D., F.R.C.P., J.P., to Mary Wedmore.

### DEATHS

JACKSON.—On Oct. 14, at the London Hospital, Margaret Nelson Jackson, B.M. Oxfd, D.P.M., an assistant editor of *The Lancet*, aged 54.

# Notes and News

## OLD ANATOMICAL THEATRES

AT the opening meeting of the Manchester Medical Society on Oct. 5, Dr. William Brockbank, the new president, gave an address on Old Anatomical Theatres and What Happened Therein. Beginning with the construction of temporary theatres, he described the change to permanent accommodation and dealt especially with the theatres at Padua, Leyden, London, Bologna, and Pavia. He described the showmen and the showmanship. An anatomical demonstration was more of a theatrical occasion than a lesson and was often attended by the outstanding personalities of the town and members of the general public of both sexes. Nevertheless the theatres were without doubt the first laboratories and the first places in which scientific research was carried out. They were the rooms in which anatomy developed from a crude to an exact science, thus paving the way for the work of the physiologists. Many great teachers spread their knowledge from these old buildings. The beautifully illustrated textbooks of Vesalius, Eustachius, Bidloo, Scarpa, and Albinus, to name only a few, came from them. Physiology, and for that matter modern medicine too, were born in one of them when Fabricius supplied Harvey with the idea that led him to the discovery of the circulation of the blood. Physiologists used them, for Galvani demonstrated his experiment with electricity on the nerves of the frog in the theatre at Bologna. Morgagni, working and teaching under adverse conditions, founded the science of pathological anatomy. Last, but by no means least, countless generations of medical students had learnt at first hand the detailed architecture of the human body and the correlation of post-mortem findings with clinical observations. And if carnival masks, flute-players, and banquets supplied some light relief to the story they in no way detracted from the great importance of the rôle of the theatres of anatomy in the history of medicine.

## EPILEPSY IN THE YOUNG

FROM Oct. 6 to 12 fifteen specialists from nine countries met in London under the auspices of the World Health Organisation to discuss juvenile epilepsy. Among their recommendations was the formation of diagnostic and treatment centres with modern methods of treatment. In the future fewer and fewer children, they believed, would need even semipermanent institutional care and the emphasis should be on integrating handicapped children, as far as possible, into the community. Possible prophylaxis against the effects of birth injuries and infections of early childhood was also discussed. Members of the conference included Prof. Fraser Brockington, Dr. Romanes Davidson, Prof. J. R. Hargreaves, and Dr. Peter Henderson.

## A NEW INDUSTRIAL MEDICAL CENTRE

THE Shell Petroleum Company has built a medical centre to provide "on-the-spot" treatment for the 4000 personnel employed at its refinery at Shell Haven in Essex. Since the centre was opened three months ago, nearly 4000 treatments have been given, including 300 to eye casualties, and 95 patients have been sent either home under the care of their own doctors, or to hospital. The aim of the centre is to give round-the-clock medical attention to employees so that they need not leave the refinery, but there is no question of usurping the functions of the general practitioners or the hospitals, with whom there is close liaison. Treatment started outside the refinery, such as the daily dressings of wounds and physiotherapy, can be continued in the centre, thereby easing the burden of the local doctors and saving man-hours.

The design of the centre is functional, and the inside walls are painted in a variety of bright colours (a scheme which has been found to reduce fatigue and bolster morale in the engine-rooms of the company's tankers). The centre, which is planned to reduce the patient's waiting-time as far as possible, is divided into three compact units: a treatment area; specialist rooms; and a group of rooms for investigation, including an X-ray room, a small laboratory, and a consulting-room. The treatment-room is divided into two sections—one for "dirty" surgery and the other for "clean" surgery and burns. A recovery-room, to which a badly injured patient can be taken straight from the ambulance, adjoins the treatment-room and the X-ray department. Certain specialists working under the National Health Service attend regularly, and there is accommodation in the specialist rooms for an ophthalmologist, an optician, and a dentist. There is also a physiotherapy-room and a one-bed ward.

Chest radiography, urine-testing, and blood-counts are regularly carried out on all men handling dangerous chemicals, such as benzine and tetra-ethyl lead; and new entrants and employees going abroad are routinely checked.

The staff consists of the refinery doctor, the sister-in-charge, two nurses, a combined radiographer and laboratory technician, a secretary, and four first-aider/drivers.

## University of Oxford

At a congregation held on Oct. 11 it was resolved to confer by decree the degree of M.A. on Surgeon Rear-Admiral James Hamilton, director of postgraduate medical studies in the university.

## University of London

At a recent examination for postgraduate diplomas the following were successful:

*D.C.P.*—Ram Prasad Agrawal, C. de V. Bevan, Ethel A. V. Brooks, Israel Chanarin, P. J. Dawson, L. W. Duchen, J. C. B. Fenton, J. S. Gordon, M. U. Henry, T. P. S. Mulligan, Chandawimala de Silva Muthucumarana, Jack Rusius, Kanagaratnam Shanmugaratnam, R. W. Snyder, P. J. Stevens, R. C. Taylor, Rai Ranendranath Chaudhuri, Hla Thein, S. O. Waller, D. C. Watler.

*D.P.H.*—Cezary Cywinski, Ponniah Nadarasa, Mularical Ittyrah Varkki.

## University of Birmingham

The title of reader in pathology has been given to Dr. D. B. Brewer. Dr. O. H. Wolff has been appointed first assistant to the chair of pædiatrics and child health, Dr. B. D. Bower lecturer in pædiatrics and child health, and Dr. J. M. Bishop lecturer in medicine.

## University of Leeds

The annual dinner of the past and present men medical students of this university will be held at 7.30 P.M. on Friday, Nov. 25, in the Hotel Metropole, Leeds. Further particulars may be had from Mr. James Dowson, hon. secretary, School of Medicine, University, Leeds, 2.

## University of Durham

Dr. Martin Roth has been appointed to the chair of psychological medicine in succession to Dr. Alexander Kennedy, who has become professor of psychiatry in the University of Edinburgh.

Dr. Roth, who is 37, qualified from St. Mary's Hospital in 1941, took the M.B. Lond. in 1943, the M.R.C.P. the following year, and the M.D. Lond. in 1946. He was house-physician at St. Mary's Hospital medical unit at Basingstoke and held registrarships at the Maida Vale Hospital and the Maudsley Hospital in London before he was appointed as a psychiatrist at the Crichton Royal, Dumfries, where he was also in charge of the department of electro-encephalography. He has held his present appointment as director of clinical research at Graylingwell Hospital, Chichester, since 1950. In 1954 he was visiting lecturer and director of a department at the Allan Memorial Institute of Psychiatry at McGill University, Montreal. In 1951 he was awarded the Burlingame prize of the Royal Medico-Psychological Association for his study of the mode of action of convulsive treatment. His other published work includes papers on mental disorder in old age, the effects of parietal lobe lesions, and clinical electro-encephalography. He is one of the authors of the textbook *Clinical Psychiatry* which was published last year.

## Royal College of Surgeons in Ireland

On Oct. 14 the licence in midwifery and surgery of the college was conferred on Jean le Brocquy.

## Society of Apothecaries of London

On Wednesday, Nov. 16, Sir Zachary Cope will give the first Gideon De Laune lecture, when he will speak on the Society of Apothecaries and Medical Education. The lecture will be given in the hall of the society and will begin at 5.30 P.M.

## Kettle Lecture

Prof. J. H. Dible, will deliver the Kettle lecture on Friday, Dec. 2, at 5 P.M., in the Institute of Pathology, Royal Infirmary, Cardiff. He is to speak on Ischæmia in the Peripheral Circulation.

## Association of Clinical Biochemists

At the annual general meeting of the association on Oct. 1, the following officers were elected: president, Prof. N. F. Maclagan; chairman, Dr. C. P. Stewart; treasurer, Dr. I. MacIntyre; secretary, Dr. A. L. Tárnoky, Royal Berkshire Hospital, Reading. The annual general meeting of the southern region of the association will be held on Saturday, Nov. 5, at Stoke Mandeville Hospital, Aylesbury.

## Royal College of Surgeons of England

At a meeting of the council on Oct. 13, with Mr. Julian Taylor, the senior vice-president, in the chair, Mr. R. P. Scott Mason (Birmingham) was admitted as vice-president, and Mr. A. C. H. Bell (Westminster Hospital) was admitted as a coöpted member of council for 1955–56, representing gynæcology and obstetrics. Dr. J. B. Walter was appointed senior lecturer in pathology. Handcock prizes were presented to M. A. Harper (Birmingham) and J. L. McClure (London Hospital). P. E. Copus (Cardiff High School and Cambridge University) was admitted as a Macloghlin scholar.

Diplomas of membership were granted to S. T. G. Butterworth and R. B. Jenkins, and diplomas in child health, jointly with the Royal College of Physicians, to the following:

Eoin Aberdeen, Iqbal Ahmed, Barbara D. Allen, Mary L. Assinder, P. J. C. Barry, P. F. Benson, Adela M. Blair, P. O. Bodley, Margaret M. Boylan, D. R. Boyns, E. P. Brasted, Margaret H. Buston, J. C. D. Callander, Leela Chacko, Maret Champion, Beatrice S. Chinniah, Keitha Corlett, Elizabeth J. Coulter, Deborah M. T. J. Cronin, Gerwin S. D. Davis, Dennis Dean, A. S. H. de Silva, J. J. H. Eastwood, M. A. Fernando, K. C. Finkel, K. M. Fraser, Mary I. Gibbons, R. M. H. Gompertz, Georgina Gorman, Irene M. Ibler, Alline M. W. James, Agnes M. T. Kelly, W. P. Kennedy, M. A. Kibel, J. F. King, Mary F. Knight, Kim Siong Lim, Audrey M. Lowry, Lena M. MacBean, Morag S. Macdonald, Elizabeth U. Macgregor, M. B. McKerrow, Valerie C. Magner, Ma Ma Tin, Margaret B. Manson, H. A. Martinson, Muhammad Saleh Abutalib Memon, D. H. Miller, J. M. Moffitt, D. C. Morley, Patricia E. Mortimer, Karunasena Jagodage Nanayakkara, Margaret A. Norman, Irene F. Osmund, Dorab Jehangir Patel, Mary C. Peard, Patricia M. Perera, B. W. Petty, Harold Price, Elizabeth Pryce-Jones, E. J. Raffle, Bapu Raghavendra Rama Rao, Mary Rennie, D. J. Robinson, Jagat Narain Rohatgi, Patricia A. Russell, Wedad Salama, Rajeswary Sathasivam, Ian Schneideman, Marjorie E. J. Shafto, Lorna J. Shankland, Rita W. Shannon, Gopal Sharan, Gwyneth M. Stevens, Dorothy A. Sutherland, G. B. Taylor, Arthur Trueman, Chinnamma Varkki, J. D. Waldman, Elizabeth H. M. Walker, Barbara A. Wallace, Patricia G. Wallis, Coral I. Welch, Margaret S. I. Williams, Meriel Williams, V. G. Wills, A. C. Woodmansey.

On Thursday, Nov. 10, Prof. L. Deloyers, of Brussels, will give the Moynihan lecture on a New Curative Operation for Peptic Ulcer—Reversed Gastrectomy. On Wednesday, Nov. 23, Prof. B. L. McFarland will deliver the Robert Jones lecture. He has chosen as his title The Crooked Tree. Both lectures will begin at 5 P.M. On Thursday, Nov. 3, at 3.30 P.M., Dr. M. H. Armstrong Davison will give the Frederic Hewitt lecture of the Faculty of Anæsthetists. His title is to be Ut non Percipiatur Dolor. All the lectures will be held at the college, Lincoln's Inn Fields, London, W.C.2.

## Medical Films

The *Presse Médicale* is this year again offering prizes for amateur medico-surgical films. Applications for further details should be sent as soon as possible to the offices of the journal, 120, Boulevard Saint-Germain, Paris, VI.

## Research Defence Society

On Wednesday, Nov. 16, at 5.30 P.M. Sir Henry Dale, O.M., F.R.S., will deliver the Stephen Paget lecture. He is to speak on Humanity's Rising Debt to Medical Research. The lecture will be given at University College, Gower Street, London, W.C.1.

## The Handicapped Child

A conference on this subject is to be held at the Highgate wing of the Whittington Hospital, Dartmouth Park Hill, London, N.19, on Saturday, Oct. 29, at 2 P.M., when Dr. Ronald Mac Keith and Dr. Ann Mower White will speak.

## Royal Free Hospital Medical Society

The inaugural meeting of this society will be held at the medical school on Thursday, Oct. 27, at 6.30 P.M. The chair will be taken by Sir Daniel Davies, president of the society, and the inaugural address will be given by Sir Lionel Whitby, regius professor of physic in the University of Cambridge, who will speak on Medicine and Medical Societies. The society has been formed to promote unified activity, in extra-curricular matters of medical interest, of the staff and the students of the Royal Free Hospital Group and of the Royal Free Hospital School of Medicine.

## Exhibition on Mental Health

Sir Walter Monckton, Minister of Labour and National Service, and Mr. Iain McLeod, Minister of Health, will together open this exhibition at the Central Hall, Westminster, at 11 A.M. on Monday, Nov. 7. The aim of the exhibition is to dispel misunderstanding and ignorance about mental illness and mental deficiency. It will be open to the public from 2 P.M. to 6 P.M. on Nov. 7 and then daily from 10 A.M. to 6 P.M. till Nov. 12.

## Congress on Dietetics

The second International Congress of Dietetics is to be held in Rome from Sept. 10 to 14, 1956.

## British Psychological Society

On Wednesday, Oct. 26, the medical section of this society will meet at 1, Wimpole Street, London, W.1, to hold a symposium on Jung's Contribution to Analytical Thought and Practice.

## Christian Medical Education in India

A meeting is to be held on Tuesday, Nov. 1, at 5.30 P.M., at 26, Portland Place, London, W.1, in connection with the work at Vellore and Ludhiana Medical Colleges. Dr. C. C. Chesterman will be in the chair. Invitation cards may be had from the secretary, Medical Missionary Association, 31, Bedford Place, W.C.1.

## St. Thomas's Hospital

The old students' dinner will be held at the Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.2, on Thursday, Nov. 10, at 7.30 P.M. Dr. R. C. Jewesbury will be in the chair. Tickets (£1 11*s.* 6*d.*) may be had from the hon. secretaries at the hospital.

## West End Hospital for Neurology and Neurosurgery

The medical staff of the West End Hospital for Neurology and Neurosurgery gave a dinner on Oct. 7 to celebrate the reopening of the hospital at 91, Dean Street, W.1. Dr. T. Rowland Hill, chairman of the medical committee, presided and the guests included Lord Bruntisfield, patron of the hospital, Sir Russell Brain, P.R.C.P., and Sir Ernest Gowers. Sir Russell, proposing The Hospital, said that surely no hospital could have suffered more complete destruction than the West End Hospital. Yet those who believed in it, both laymen and doctors, fought that it should survive, and their faith has been justified. In its new home the hospital would more than maintain its long tradition of service to its patients and to neurology. Sir Russell observed that some people had suggested that the need for special hospitals was passing, and that the work they did could be done equally well in the special departments of general hospitals. He thought that was quite untrue: each was indispensable. The special department had the advantage of bringing a specialty into close relationship with general medicine, but the special hospital allowed interplay between many minds occupied with different aspects of a subject; and for this there was no substitute as a training for specialists and, indeed, as part of the continued education of the specialists themselves. It was also a centre which could teach the non-specialist where the specialist could help him, and that was very necessary in neurology today. Sir Russell referred to a "most serious gap" in the hospital and consultant part of the National Health Service—the lack of sufficient neurologists. There were large and important areas of the country with no neurological consultant, and where, therefore, the patient was not getting the comprehensive service he was promised, and for which he was paying. And the obverse of this was the unhappy group of trained and experienced neurologists who could not get the consultant work they needed and which needed to be done. Sir Russell coupled the toast with the name of Dr. Rowland Hill, and he spoke warmly of Dr. Hill's courage and clarity in the deliberations of the Central Consultants and Specialists Committee and the Joint Consultants Committee. In his reply, Dr. Rowland Hill recalled some of the physicians and surgeons in the history of the hospital, and he said that their Ulysses-like qualities of courage and endeavour were needed today. Speaking of future plans, he said there were hopes that a separate long-stay unit would be acquired soon for neurological patients. Mr. Geoffrey Knight proposed The Guests, and Lord Bruntisfield replied.

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Mr. Frank Law has been elected master of the Worshipful Company of Spectacle Makers.

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CORRIGENDA: *West Midlands Physicians Association.*—The date of the autumn meeting of this association is Saturday, Oct. 22 (not Oct. 21 as stated in our last issue).

*Osler's Oxford House.*—The Osler Club was responsible only for the plaque which was unveiled on Oct. 8 (*Lancet*, Oct. 15, p. 831). The reopening of Osler's house and the arrangements for its use were made by Prof. A. D. Gardner and the officers of the University of Oxford.

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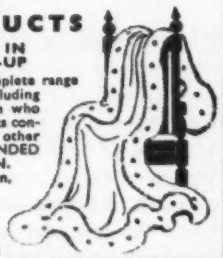

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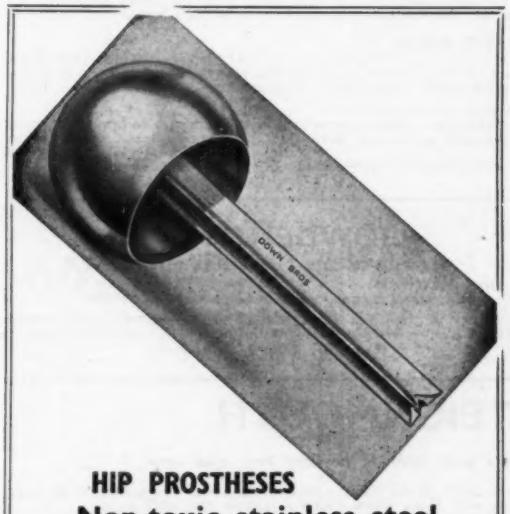


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28TH NOVEMBER–2ND DECEMBER, 1955

Monday, 28th November—Town Section
Electrical examination in neuro-muscular disorders .. Mr. D. M. BROOKS
Spina bifida .. .. .. Mr. J. I. P. JAMES
Some deformities associated with neurological disorders (1) .. Dr. P. H. SANDIFER
Mr. J. I. P. JAMES
Pathology of poliomyelitis .. .. Dr. H. A. SISSONS
Tuesday, 29th November—Town Section
Some deformities associated with neurological disorders (2) .. Dr. P. H. SANDIFER
Traumatic paraplegia .. .. .. Dr. L. GUTTMANN
Cerebral palsies of infancy (1) .. .. Dr. P. H. SANDIFER
Wednesday, 30th November—Town Section
Pathology of muscle .. .. .. Dr. H. A. SISSONS
Cervical disc lesions .. .. .. Mr. H. O. CLARKE
Cerebral palsies of infancy (2) .. .. Dr. P. H. SANDIFER
Nerve injuries at the wrist .. .. Mr. H. J. SEDDON
Pathology and diagnosis of intervertebral disc lesions .. Mr. H. J BURROWS.
Thursday, 1st December—Country Section
Poliomyelitis—early treatment .. Mr. D. M. BROOKS
Surgery of spastic paralysis .. .. Mr. K. I. NISSEN
Compression paraplegia .. .. .. Mr. V. LOGUE
Friday, 2nd December—Country Section
Poliomyelitis—late treatment .. .. Mr. J. A. CHOLMELEY
Clinical demonstration .. .. .. Mr. D. TREVOR
Nerve injuries complicating fractures .. Mr. H. J. SEDDON

The fee for this course (including lunch and tea) is 7 guineas. Early application should be made to the Dean, at 234, Great Portland-street, London, W.1.

### THE INSTITUTE OF LARYNGOLOGY AND OTOLOGY
(UNIVERSITY OF LONDON)
330/332, Gray's Inn-road, London, W.C.1

PRACTICAL REVISION CLASS FOR PART II D.L.O. STUDENTS

To include applied anatomy, histology, morbid anatomy, case-demonstrations, demonstrations of instruments and apparatus, practice examination papers, &c., from 23RD NOVEMBER to 6TH DECEMBER, 1955.

Fee: £5 5s.

Detailed syllabus obtainable from the Dean.

### KETTLE MEMORIAL LECTURE

The KETTLE MEMORIAL LECTURE, entitled "Ischæmia in the peripheral circulation," will be delivered by Prof. J. H. DIBLE, Postgraduate Medical School of London, on FRIDAY, 2ND DECEMBER, 1955, at 5 P.M., in the Institute of Pathology, Royal Infirmary, Cardiff.

### McGILL UNIVERSITY, MONTREAL

TRAINING IN PSYCHIATRY

The Department of Psychiatry, McGill University, Montreal, has a limited number of openings for training, and applications are now being considered. Applicants must have graduated from an approved medical school and have had a general internship of 1 year.

The 4-year DIPLOMA COURSE provides general basic preparation during the first 2 years. The last 2 years provide special patterns of instruction for those: (*a*) planning to enter the field of general hospital, community or university psychiatry; (*b*) preparing themselves for a career in child psychiatry; (*c*) intending to enter the field of research psychiatry. Credit may be allowed for previous training. Shorter periods of instruction may be arranged, as well as instruction in special fields. Full training in psychoanalysis also may be undertaken within the Department of Psychiatry by suitably prepared candidates. Separate application for this training is required.

All those accepted for training are assigned to 1 of the 7 teaching centres in Montreal. These positions carry with them board and lodging, or, in lieu of lodging, a living-out allowance together with an honorarium ranging from $40 to $100 a month, depending upon the clinical position to which the applicant is assigned. For those in the advanced years of the course, clinical positions carrying higher salaries are available. In several centres, additional emoluments of $1800 a year are available, mainly in the form of bursaries, these being issued under certain conditions in regard to which information will be given on request.

Applicants should write to the Chairman of the Department of Psychiatry, McGill University, Montreal, Canada.

### UNIVERSITY OF EDINBURGH

CHAIR OF BACTERIOLOGY

The University Court will shortly proceed to make an appointment to the above Chair which is now vacant.

The terms and conditions of appointment may be obtained from the undersigned, with whom applications (10 copies), giving the names of 2 referees, and including any testimonials or evidence candidates may wish to offer, should be lodged not later than 31st December, 1955. A candidate from overseas may submit 1 copy of his application.

CHARLES H. STEWART, Secretary to the University.

### SOCIETY OF APOTHECARIES OF LONDON

DIPLOMA IN INDUSTRIAL HEALTH

The next Examination will begin on MONDAY, 5TH DECEMBER, 1955. The following Examination will be held in July, 1956.

For Regulations apply Registrar, Apothecaries' Hall, Black Friars-lane, London, E.C.4.

### INSTITUTE OF CHILD HEALTH
UNIVERSITY OF LONDON

Mr. J. J. MASON BROWN, O.B.E., F.R.C.S.(ED.), Surgeon to the Royal Hospital for Sick Children, Edinburgh, and Lecturer in Pædiatric Surgery at Edinburgh University, will deliver the ALEX SIMPSON SMITH LECTURE for 1955 on FRIDAY, 18TH NOVEMBER, 1955, at 5 P.M. at The Hospital for Sick Children, Great Ormond-street, W.C.1.

Subject: "Acute Appendicitis in Infancy and Childhood."

Admission by ticket only.

Apply: the Dean, Institute of Child Health, The Hospital for Sick Children, Great Ormond-street, London, W.C.1.

**THE MEDICAL COLLEGE OF ST. BARTHOLOMEW'S HOSPITAL**, West Smithfield, E.C.1. Applications are invited for the post of LECTURER IN PHYSIOLOGY, tenable as from 1st January, 1956. Preference may be given to applicants with medical qualifications. The salary is on a scale of £900–£100–£1400 p.a., together with children's allowance and membership of the F.S.S.U., and the commencing point on the scale will depend upon experience in teaching and research.

Applications, which should be received not later than 12th November, 1955, should be addressed to the Dean of the Medical College, from whom further particulars may be obtained.

**UNIVERSITY OF LONDON KING'S COLLEGE** will require on 1st January, 1956, a LECTURER IN PHARMACOLOGY. The appointment will be on the scale of £900–£100–£1400 with family allowances and F.S.S.U. benefits, the starting point being according to qualifications and experience.

Particulars and application forms should be obtained from the Registrar, King's College, Strand, W.C.2, whom completed applications forms should reach by 15th November.

**THE UNIVERSITY OF MANCHESTER.** Applications are invited for the EWING FOUNDATION FELLOWSHIP in the Department of Education of the Deaf tenable for 2 years with a possibility of renewal after that period. Candidates should possess a medical qualification. Experience either as a Senior or Assistant Medical Officer of Health or in the field of pædiatrics or otology is desirable. The gross value of the Fellowship will be within the range of £1500–£1900 p.a.; the stipend being determined according to qualifications and experience.

Applications should be sent not later than 12th November, 1955, to the Registrar, the University, Manchester, 13, from whom further particulars and forms of application may be obtained.

**THE UNIVERSITY OF MANCHESTER.** Applications are invited from candidates with medical qualifications registrable in this country for the post of LECTURER or ASSISTANT LECTURER IN ANATOMY. Good research facilities available. Salary scales p.a.; Lecturer £1000–£1800; Assistant Lecturer, £700–£1100, with membership of F.S.S.U. and children's allowance scheme; initial salary and status according to qualifications and experience. The successful candidate will be expected to take up his duties as soon as possible.

Applications should be sent, not later than 7th November, 1955, to the Registrar, the University, Manchester, 13, from whom further particulars and forms of application may be obtained. Overseas applicants should send letters of application giving details of qualifications and experience, and should submit the names of at least 2 persons to whom reference may be made.

**THE UNIVERSITY OF MANCHESTER.** Applications are invited from candidates with medical qualifications registrable in this country and interests in bacteriology or virology for the post of SENIOR LECTURER or LECTURER IN BACTERIOLOGY. Good research facilities are available. Salary scales per annum: Senior Lecturer £1500–£2000; Lecturer £1000–£1800 with membership of F.S.S.U. and children's allowance scheme; initial salary and status according to qualifications and experience. The successful candidate will be expected to take up his duties as soon as possible.

Applications from candidates in the United Kingdom should be sent, not later than 19th November, 1955, to the Registrar, the University, Manchester, 13, from whom further particulars and forms of application may be obtained. Overseas applicants should send letters of application (no forms) as soon as possible giving details of qualifications and experience, and should submit the names of at least 3 persons to whom reference may be made.

**THE UNIVERSITY OF SHEFFIELD.** Applications are invited for a post of ASSISTANT LECTURER or LECTURER IN PHARMACOLOGY in the Department of Pharmacology and Therapeutics, to begin duties on 1st January, 1956, or as soon as possible thereafter. Salary scales: (*a*) for non-medically qualified candidates—Assistant Lecturer, £550–£50–£650; Lecturer, £650–£50–£1350; (*b*) for medically qualified candidates—Assistant Lecturer, £700–£50–£800; Lecturer, £800–£100–£1700, with F.S.S.U. provision and family allowance. Initial salary according to qualifications and experience.

Applications (4 copies) should reach the Registrar (from whom further particulars may be obtained) by 12th November, 1955.

## Hospital Services: Senior Appointments

**ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234**, Great Portland-street, London, W.1. Applications are invited for the appointment as Part-time CONSULTANT in E.N.T. Surgery; duties include visiting the Town and Country Hospitals when required and is assessed as 1 notional half-day a week. Candidates must have had wide experience in E.N.T. surgery.

Applications (1 copy), giving date of birth, qualifications, experience and names of 3 referees, to be addressed to the House Governor by 15th December, 1955.

**ST. THOMAS'S HOSPITAL, London, S.E.1.** Assistant RADIOLOGIST (whole-time). Salary £1500–£1950 p.a.

Applications, naming 2 referees, to the Clerk of the Governors by 2nd November.

**NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.**
(1) CONSULTANT PATHOLOGIST (whole-time or maximum sessions), Hitchin hospitals (total beds approximately 560). Duties, mainly hæmatology and bacteriology, based on the Lister Hospital.
Applications by 21st November, 1955.
(2) CONSULTANT PATHOLOGIST (whole-time or maximum sessions), National Temperance Hospital, Hampstead-road, N.W.1 (158 Beds).
Applications by 30th November, 1955.
(3) ASSISTANT CHEST PHYSICIAN (whole-time), Senior Hospital Medical Officer grade, Luton Chest Clinic, Grove-road, Luton. Associated with the clinic is a subsidiary clinic at the Lister Hospital, Hitchin, and 33 Beds in St. Mary's Hospital, Luton. Candidates should have good general medical experience and special experience in treatment of tuberculosis and diseases of the chest.
Applications by 23rd November, 1955.
Hospitals and Clinic may be visited by direct appointment.
Application forms obtainable from, and returnable to, Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

**BIRMINGHAM REGIONAL HOSPITAL BOARD.** Whole-time CONSULTANT PATHOLOGIST in charge of Virus Laboratory, Little Bromwich General Hospital (includes 288 infectious diseases beds). Laboratory under general direction of Group Pathologist, available to neighbouring groups. Special knowledge bacteriology, with special interest in virology; experience general pathology desirable but not essential.
Applications (15 copies), stating name, age, nationality, qualifications, present and previous appointments and details of 3 referees, to Secretary, 10, Augustus-road, Birmingham, 15, before 7th November, 1955.

**EAST ANGLIAN REGIONAL HOSPITAL BOARD.**
(1) CONSULTANT PHYSICIAN (whole-time or maximum part-time), Norfolk and Norwich Hospital Group. Main hospital Norfolk and Norwich (441 Beds). Candidates invited to visit hospitals by direct arrangement with Hospital Management Committee Secretary, Norfolk and Norwich Hospital.
(2) CONSULTANT RADIOLOGIST (whole-time) at Hospitals in the Peterborough and Stamford area. New appointments created to meet the increased volume of radiological work in the Group. Duties mainly at Peterborough Memorial Hospital where there is a new and fully equipped X-ray Department. Wide experience in specialty and higher qualifications essential. Candidates invited to visit Hospital by direct arrangement with Hospital Management Committee Secretary, Peterborough Memorial Hospital.
Applications (8 copies), stating age, experience and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 7th November, 1955.

**MANCHESTER REGIONAL HOSPITAL BOARD.** Whole-time RESIDENT DEPUTY MEDICAL SUPERINTENDENT AND ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer) at Springfield (Mental) Hospital, Manchester (800 Beds). Temporary accommodation available in Hospital flat, modern detached house now being built in Hospital grounds. D.P.M. essential.
Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by 7th November, 1955.

**SHEFFIELD REGIONAL HOSPITAL BOARD.** Maximum Part-time CONSULTANT CHILDREN'S PSYCHIATRIST for Barnsley, Rotherham and the surrounding West Riding Area.
Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 19th November, 1955.

**SHEFFIELD REGIONAL HOSPITAL BOARD.** Whole-time ASSISTANT PATHOLOGIST required General Hospital, Nottingham. The successful candidate will work under the supervision of the Pathologist-in-charge of the Department. Applicants should have general all-round experience in clinical pathology, but a special interest in hæmatology is desirable. A higher medical qualification will be an advantage. Salary scale £1500–£50–£1950.
Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 15th November, 1955.

**SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS AND THE UNIVERSITY OF SHEFFIELD.** Applications are invited from medical practitioners holding suitable qualifications for the whole-time post of CONSULTANT PSYCHIATRIST AND PROFESSOR OF PSYCHIATRY. The person appointed will be required to establish a new department in The United Sheffield Hospitals containing a total of 36 Beds, of which 8 will be at the Royal Infirmary and 28 in premises at Fulwood on the outskirts of the city to be specially adapted for the purpose. Outpatient facilities will be provided at the Royal Infirmary and at Fulwood. He will be expected to work in conjunction with the existing departments in The United Sheffield Hospitals and of the Sheffield Regional Hospital Board.
Applications (30 copies), stating age, qualifications and experience, with the names of 3 referees, should be sent not later than 10th December, 1955, to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1, from whom further particulars may be obtained.

**WARE, HERTFORDSHIRE. WARE PARK HOSPITAL.** (129 tuberculosis beds.) Locum SENIOR HOSPITAL MEDICAL OFFICER (Chest Physician) required for period 19th February, 1956–13th May, 1956. Resident.
Applications, with names of referees, to Secretary, Hertford Group Hospital Management Committee, Hertford County Hospital, Hertford, Herts (Tel.: Hertford 2275).

**SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD** requires Whole-time CONSULTANT PSYCHIATRIST at Netherne Hospital, Coulsdon, Surrey. Candidates should possess the D.P.M. and a higher medical qualification. Appointment includes responsibilities at outpatients clinics and duties at all hospitals in the Group, including Annexe at Bletchingly.
Applications (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 19th November, 1955. Applicants may visit Hospital by local arrangement.

**WIGAN AND LEIGH HOSPITAL MANAGEMENT COMMITTEE.** Locum SENIOR HOSPITAL MEDICAL OFFICER in Chest Diseases (Male or Female). Urgently required for at least 3 months. Resident or non-resident post. Previous experience in chest work desirable.
Applications to Secretary, Knowsley House, Wigan.

**AUSTRALIA. ROCKHAMPTON HOSPITAL, QUEENSLAND (AUST.).** Applications in writing are invited for appointment as SPECIALIST E.N.T. SURGEON at the Rockhampton Base Hospital. The appointee is required to give 2 three-hour sessions per week, plus emergency calls if required by the Medical Superintendent. The appointment is a part-time one with right of private practice. Salary is £580 p.a. Rockhampton has a population of 42,000 and is the centre of a district of 90,000 population. Further particulars regarding the position and opportunity for private practice will be forwarded upon request.
Applications should be addressed to the Secretary, Rockhampton Hospitals Board, Rockhampton. Applications close 30th November, 1955.

**NEW ZEALAND. NORTHLAND HOSPITAL BOARD, WHANGAREI, NEW ZEALAND.** Applications are invited from qualified medical practitioners for the position of Part-time VISITING E.N.T. SPECIALIST.
Conditions of appointment available from the High Commissioner, New Zealand House, London, or the Secretary, Northland Hospital Board, P.O. Box 403, Whangarei, New Zealand, with whom applications close on 1st December, 1955.

## Hospital Services : Junior Appointments

**ACTON HOSPITAL, Gunnersbury-lane, W.3.** Senior HOUSE OFFICER (resident) required for casualty duties. Post vacant 1st December, 1955.
Applications to Hospital Secretary within 7 days.

**ACTON HOSPITAL, Gunnersbury-lane, London, W.3.** Part-time MEDICAL REGISTRAR required for 3 sessions per week for inpatient and outpatient duties. Ministry of Health conditions of service. Salary pro rata to whole-time scale.
Applications within 7 days to Group Secretary, Central Middlesex Group Hospital Management Committee, Central Middlesex Hospital, Park Royal, N.W.10.

**BATTERSEA GENERAL HOSPITAL, Battersea Park, S.W.11.** CASUALTY OFFICER (residence optional). House Officer or Senior House Officer grade according to experience. Vacant immediately; not pre-registration.
Apply Hospital Secretary enclosing 2 copies of recent testimonials.

**BOLINGBROKE HOSPITAL, Wandsworth Common, S.W.11.** HOUSE SURGEON (resident), vacant 18th November. Open to registered practitioners and pre-registration candidates.
Apply Hospital Secretary, enclosing copies of 3 recent testimonials, by 25th October, 1955.

**BOLINGBROKE HOSPITAL, Wandsworth Common, S.W.11. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.** REGISTRAR (medical), whole-time, non-resident, for 1 year in the first instance from 1st February, 1956.
Forms of application from the Secretary, Battersea and Putney Group Hospital Management Committee, 54, Upper Richmond-road, S.W.15, to whom they should be returned within 14 days.

**CHARING CROSS HOSPITAL, W.C.2.** Applications are invited for the following pre-registration appointments, tenable for 6 months from 15th December, 1955 :—

(*a*) **Charing Cross Hospital**
HOUSE PHYSICIAN to the Radiological Department. (Candidates taking the D.M.R. will be given time off to attend lectures.)

(*b*) **Mount Vernon Hospital**
HOUSE SURGEON to the Gynæcological Department.
HOUSE PHYSICIAN.
HOUSE SURGEON.

(*c*) **Harrow Hospital**
1 HOUSE PHYSICIAN.
2 HOUSE SURGEONS.

(*d*) **Wembley Hospital**
1 HOUSE PHYSICIAN.
3 HOUSE SURGEONS.

Application forms to be returned to the undersigned as soon as possible.
FRANK HART,
House Governor and Secretary to the Board.

**CHARING CROSS HOSPITAL GROUP. Harrow HOSPITAL.** CASUALTY OFFICER (Junior Hospital Medical Officer). Tenable from 15th December, 1955.
Application forms to be returned to the undersigned as soon as possible. FRANK HART, Secretary to the Board.
Charing Cross Hospital, W.C.2.

**CONNAUGHT HOSPITAL, Walthamstow, E.17.** (118 Beds.) HOUSE SURGEON required for 6 months (General Surgery and Special Departments). Post vacant 16th November, 1955. Recognised for F.R.C.S.
Applications, with full details and copies of 2 recent testimonials, should be sent immediately to the Secretary, Hospital Management Committee, Forest Group, Langthorne-road, E.11.

**CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10.** NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR (whole-time) required in General Medical and Cardiological Department of above Hospital. Experience in chest and heart disease desirable. Opportunity for research work. Resident when on duty. Appointment for 1 year, renewable. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, Central Middlesex Group Hospital Management Committee, Park Royal, N.W.10, by 1st November, 1955.

**EAST END MATERNITY HOSPITAL, 384/398, Commercial-road, London, E.1,** (60 Beds.) Post recognised for M.R.C.O.G. RESIDENT OBSTETRICAL OFFICER (House Officer, third post), required for 6 months. Post vacant 1st November, 1955.

Applications, with copies of testimonials, to the Secretary, Stepney Group Hospital Management Committee, Raine-street, Wapping, E.1.

**GROUP LABORATORY AT ST. OLAVE'S HOSPITAL,** Lower-road, Rotherhithe, S.E.16. BERMONDSEY AND SOUTHWARK HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (pathology and general medicine) required for the above Laboratory. Salary £745 p.a., appointment initially for a period of 1 year from 1st January, 1956.

Applications, with full details and names of 2 referees, to Secretary, at the above address.

**GUY'S HOSPITAL, London, S.E.1. Applications are** invited for the appointment of REGISTRAR (first year) to the Radiotherapy Department (whole-time). D.M.R. preferred but not essential. Duties to commence 1st January, 1956.

Forms of application are available from the Superintendent, Guy's Hospital, London Bridge, S.E.1, and should be forwarded not later than 7th November, 1955.

**HACKNEY GROUP HOSPITAL MANAGEMENT COMMITTEE.** Applications are invited for the 12 months appointment of RESIDENT SENIOR HOUSE OFFICER (anæsthetics) from 1st October. Duties shared between German Hospital (General—157 Beds) and the Mothers' Hospital (Salvation Army) (Maternity—110 Beds) with residence at German Hospital. The post offers experience in general surgical anæsthesia in the Group and facilities are provided to study for higher examinations.

Apply, with testimonials, to Group Secretary, Hackney Hospital, London, E.9, quoting GMH/SHO.

**HACKNEY HOSPITAL, London, E.9. (General—841** Beds.) Applications are invited from registered medical practitioners for 6 months appointment, vacant 1st December, as HOUSE PHYSICIAN.

Apply Secretary, above address, by 9th November, quoting HH/HP.

**HAMMERSMITH HOSPITAL AND POSTGRADUATE MEDICAL SCHOOL,** Ducane-road, London, W.12. Whole-time NON-RESIDENT REGISTRAR (Radiodiagnostic) required. Applicants should possess the D.M.R.(D.) and be prepared to work for a higher qualification. The successful candidate will be expected to carry out liaison duties with the Department of Morbid Anatomy in addition to radiological work.

Applications, stating age, qualifications, experience, names of 2 referees, to Secretary, Board of Governors, by 7th November.

**MANOR HOUSE HOSPITAL, Golders Green, N.W.11** (exempted from National Health Service). Required, RESIDENT SURGICAL OFFICER (Male). Salary £745 p.a., less £130 p.a. for emoluments. 6 months appointment, renewable.

Applications, stating age, nationality, qualifications, and surgical or orthopædic experience, with copies of 3 recent testimonials, to Mr. W. F. PENDRILL, Secretary.

**NORTH MIDDLESEX HOSPITAL, Edmonton, N.18.** Locum SENIOR REGISTRAR in Medicine (general). Higher qualification in medicine essential. Non-resident appointment, but Registrar is required to sleep in Hospital on full duty nights (7 in 21).

Applications, stating age, nationality, qualifications, experience, with copies of recent testimonials and names of 2 referees, to Secretary of Hospital.

**NORTH MIDDLESEX HOSPITAL, Edmonton, N.18.** HOUSE PHYSICIAN, required for 6 months starting on 1st December. Recognised pre-registration appointment (first or second post). General medicine.

Applications, stating age, nationality, qualifications, experience, with copies of recent testimonials, to Secretary of Hospital by 31st October.

**NORTH MIDDLESEX HOSPITAL, Edmonton, N.18.** SENIOR HOUSE OFFICER in Surgery (resident), required for 7th December. General surgery, trauma and orthopædics. Post recognised for F.R.C.S.

Applications, stating age, nationality, qualifications (Primary F.R.C.S. desirable), experience, with copies of recent testimonials or names of 2 referees, to Secretary of Hospital, by 31st October.

**PADDINGTON GREEN CHILDREN'S HOSPITAL, W.2.** (ST. MARY'S HOSPITAL.) Applications are invited for the post of HOUSE SURGEON (pre-registration post), vacant 1st December, 1955. Tenable for 6 months.

Applications, stating age, nationality, qualifications with dates, and experience, with copies of 3 recent testimonials, should reach the Secretary not later than Saturday, 5th November, 1955.

**PADDINGTON GREEN CHILDREN'S HOSPITAL, W.2.** (ST. MARY'S HOSPITAL.) Applications are invited for the post of HOUSE PHYSICIAN (pre-registration post), vacant 1st December, 1955. Tenable for 6 months.

Applications, stating age, nationality, qualifications with dates, and experience, with copies of 3 recent testimonials, should reach the Secretary not later than Saturday, 5th November, 1955.

**LONDON CHEST HOSPITAL. Hospitals for Diseases** OF THE CHEST. 2 vacancies occur 1st December, 1955, for RESIDENT HOUSE PHYSICIAN, appointments for 6 months, 4 in London, 2 at the Country Branch near Letchworth, and posts graded as House Officer. Duties include work in the Outpatient Department and refill clinic as well as in wards.

Applications, stating date of birth, qualifications with dates, and previous appointments held with copies of 3 testimonials, should reach the undersigned not later than 29th October, 1955.

THOMAS BROWN House Governor.

London Chest Hospital, E.2.

**LONDON HOSPITAL, Whitechapel, E.1. Applications** are invited for the following SENIOR HOUSE OFFICER appointments becoming vacant on 1st January, 1956 :—

Medical Outpatients Department.
Cardiac Department.
Gynæcological and Obstetric Department.

Applications (6 copies), together with 6 copies of 3 recent testimonials, should be received by the undersigned by 4th November, 1955. H. BRIERLEY, House Governor.

**PRINCE OF WALES'S GENERAL HOSPITAL, N.15.** (219 Beds.) Applications are invited from qualified medical practitioners for appointment as RESIDENT JUNIOR HOUSE SURGEON for Casualty (pre-registration first or second post), for a period of 6 months, vacant 1st December, 1955.

Application form from Secretary, Tottenham Group Hospital Management Committee (Group 4), The Green, N.15, to be returned by 5th November, 1955.

**PRINCE OF WALES'S GENERAL HOSPITAL, N.15.** (219 Beds.) Applications are invited from qualified medical practitioners for appointment as RESIDENT JUNIOR HOUSE PHYSICIAN (pre-registration first or second post) for a period of 6 months, vacant 1st December, 1955.

Application form from the Secretary, Tottenham Group Hospital Management Committee (Group 4), The Green, N.15, to be returned by 5th November, 1955.

**PRINCESS BEATRICE HOSPITAL, Earls Court, London,** S.W.5. CASUALTY OFFICER (some anæsthetic duties), resident. Senior House Officer grade.

Applications, stating age, qualifications, with 3 testimonials, to House Governor, not later than Thursday, 3rd November, 1955.

**QUEEN ELIZABETH HOSPITAL FOR CHILDREN** MANAGEMENT COMMITTEE, Hackney-road, E.2, Shadwell, E.1, and BANSTEAD WOOD, SURREY. HOUSE OFFICERS (2). These appointments will be made for 2 consecutive periods of 6 months commencing 1st December, 1955. First appointment as House Physician and second as House Surgeon and Casualty Officer in each case.

Application forms may be obtained from the Secretary at Hackney-road, and should be returned, with copies of not more than 3 testimonials, on or before 29th October, 1955.

**ROYAL FREE HOSPITAL GROUP. Applications are** invited for the post of REGISTRAR to the X-Ray Department of the Royal Free Hospital. Duties to commence 1st December. Appointment for 1 year in the first instance. Candidates to hold D.M.R. (D).

Application forms may be obtained from the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, W.C.1. They should be returned not later than 4th November.

**ROYAL FREE HOSPITAL GROUP. Applications are** invited for the appointment of REGISTRAR to the Orthopædic Department. Applicants must be registered medical practitioners and Fellows of the Royal College of Surgeons. The appointment is for 1 year in the first instance. Duties to commence on 1st January, 1956.

Application forms may be obtained from the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, W.C.1. They should be returned not later than 4th November.

**ROYAL FREE HOSPITAL GROUP. Applications are** invited for the posts of SENIOR SURGICAL REGISTRAR in the above Group, 1 to work primarily at Royal Free Hospital, Gray's Inn-road, and the other to work at the Hampstead General Hospital. Candidates should be registered medical practitioners and Fellows of the Royal College of Surgeons. The appointments are recognised under the Senior Registrar establishment and are for 1 year in the first instance. Duties to commence on 1st January, 1956.

Applications, together with 3 names of referees, should be sent to the Secretary of the Board of Governors, Royal Free Hospital, Gray's Inn-road, W.C.1. They should be sent not later than 4th November.

**ROYAL MASONIC HOSPITAL, Ravenscourt Park,** London, W.6. Applications are invited for the post of RESIDENT SURGICAL REGISTRAR. Appointment on or about 12th December. Gross salary: first year £850 (residential emoluments of £130 deductible); second year £965 (residential emoluments of £145 deductible).

Please state age, qualifications, past and present appointments, and include 2 recent testimonials and/or the names of 2 referees. Applications should reach the undersigned (from whom further information may be obtained) on or before 10th November, 1955.

R. E. LAWSON, Secretary and House Governor.

**ROYAL NORTHERN HOSPITAL, N.7. North West** METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR in Radiology, X-ray Diagnostic Department, required at above Hospital which may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, Royal Northern Hospital, Holloway, N.7, by 1st November, 1955.

**ROYAL NORTHERN HOSPITAL, Holloway, London,** N.7. Applications are invited for the post of HOUSE SURGEON vacant 28th November, 1955. Preference given to pre-registration candidates. Recognised for F.R.C.S.

Applications, with copies of recent testimonials, to be sent to the Hospital Secretary by 1st November, 1955.

**ROYAL NORTHERN HOSPITAL, Holloway, London, N.7.** (279 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required in the Orthopædic and Fracture Department of the above Hospital. Candidates may visit the Hospital by direct appointment.

Application forms obtainable from, and returnable to, the Secretary, Royal Northern Hospital, N.7, by 8th November, 1955.

**ROYAL MARSDEN HOSPITAL, Fulham-road, London,** S.W.3 (lately Royal Cancer Hospital). Applications are invited for the post of SENIOR REGISTRAR (full-time) in the Department of Pathology. The post is open only to candidates who have completed a period of training as Senior Registrars, or are from overseas, and who wish to take a period of advanced training for not more than 2 years. Duties and training cover all branches of pathology.

Applications, quoting the names of 3 referees, should be submitted by 8th November, 1955, on a form which may be obtained from the House Governor.

**ST. ALFEGE'S HOSPITAL, Greenwich, S.E.10.** (373 Beds. Recognised for M.R.C.O.G. examination.) HOUSE OFFICER (obstetrics and gynæcology), vacant end-October. 6 months appointment (renewable). Salary £425-£525 p.a., less £125 p.a. for residence.

Applications and testimonials to Secretary, Greenwich and Deptford Hospital Management Committee, at above Hospital.

**ST. GEORGE'S HOSPITAL, S.W.1. Applications are** invited for the post of HOUSE PHYSICIAN (resident) at the Victoria Hospital for Children, Tite-street, Chelsea, S.W.3, for 6 months with effect from 1st January, 1956. Applicants should preferably have held at least 1 post as House Officer.

Applications, stating age, education, qualifications, experience, and the names of 2 referees, should reach the undersigned not later than 10th November, 1955.

P. H. CONSTABLE, House Governor.

**ST. JAMES' HOSPITAL, Balham, S.W.12. Senior House** OFFICER (pædiatric) with at least 6 months pædiatric experience. Post recognised for D.C.H. Vacant 6th November.

Applications, stating age, qualifications, experience, and names of 2 referees, to Group Secretary, Wandsworth Hospital Group, at above address by 28th October.

**ST. JOHN'S HOSPITAL, Lewisham, London, S.E.13.** LEWISHAM GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of CASUALTY OFFICER (pre- or post-registration) at the above general hospital. House Officer grade; vacant immediately and recognised for 6 months training for F.R.C.S.

Applications, stating age, qualifications and experience, with copy testimonials or names of referees, should be addressed to the Secretary, Group Offices, Lewisham Hospital, London, S.E.13.

**ST. MARY ABBOTS HOSPITAL, Marloes-road, Kensing-**ton, W.8. FULHAM AND KENSINGTON HOSPITAL MANAGEMENT COMMITTEE. Qualified medical practitioners are invited to apply for the vacancy of HOUSE SURGEON (obstetrics and gynæcology). Post recognised for M.R.C.O.G. in Obstetrics. Appointment commences 1st November, 1955, is resident and limited to 6 months.

Applications by 27th October, 1955, on forms obtainable from the Hospital Secretary (L.165).

**ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. House** PHYSICIAN (resident) for duty in Rheumatism Unit. Immediate vacancy. This post offers valuable experience in general medicine and specialised experience in rheumatic and connective tissue diseases.

Applications, naming 2 referees, to be sent to Medical Superintendent.

**THE HOSPITAL FOR SICK CHILDREN, Great Ormond-**street, London, W.C.1. There will be vacancies in December for 2 Whole-time ASSISTANT MEDICAL REGISTRARS (Registrar grade).

Further particulars and form of application, which must be returned not later than 14th November, 1955, may be obtained from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

**WANSTEAD HOSPITAL, Hermon Hill, E.11. (191 Beds.)** Applications are invited for the post of CASUALTY OFFICER, recognised for F.R.C.S. Graded Senior House Officer. Vacant 13th November, 1955. Salary £745 p.a., less £150 p.a. for board, lodging, &c.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to the Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

**WESTMINSTER HOSPITAL TEACHING GROUP.**
**Westminster Children's Hospital**

CASUALTY OFFICER required for 6 months from 1st January, 1956. Grade—House Officer (post-registration) or Senior House Officer dependent on experience.

2 HOUSE PHYSICIANS (both second pre-registration), required for 6 months from 1st December, 1955.

Applications, with copies of testimonials, should reach the Secretary, Westminster Children's Hospital, Vincent-square, S.W.1, by 5th November.

**WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1.** Applications are invited for post of REGISTRAR to the Radiological (Diagnostic) Department for 1 year in the first instance from 10th December, 1955.

Applications (6 copies), giving names of 2 referees, to House Governor by 5th November.

**WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1.** Applications invited for 2 posts of SENIOR HOUSE OFFICER to Anæsthetics Department for 1 year from 1st January and 1st February, 1956. Previous experience of anæsthetics not required, but candidates must have had at least 18 months experience of other branches of medicine.

Applications (8 copies), with names of 2 referees, to House Governor by 5th November.

**WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1.** Applications are invited for post of SENIOR REGISTRAR to the Radiological (Diagnostic) Department for 1 year in the first instance from 5th December, 1955.

Applications (10 copies), giving names of 2 referees, to House Governor by 5th November.

**WEST END HOSPITAL FOR NEUROLOGY AND** NEUROSURGERY, 91, Dean-street, W.1. CLINICAL ASSISTANT to Ophthalmologist required for 1 half-day per week (Friday morning). Salary £175 p.a.

Applications, with details of experience, &c., together with names and addresses of 2 referees, to Hospital Secretary by 7th November, 1955.

**ASHFORD HOSPITAL, Ashford, Middlesex. Staines** GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE SURGEON (Male) required at above Hospital (approximately 500 Beds), for Traumatic and Orthopædic Unit. 6 months appointment vacant now. Preference given to pre-registration candidates.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital, immediately.

**BARNSTAPLE. NORTH DEVON INFIRMARY. (Central** Group Hospital of 105 Beds.) SENIOR HOUSE SURGEON post vacant from 1st January, 1956, for 1 year. Salary £745 p.a. (5-roomed furnished flat available, rent £75 p.a.)

Applications, with customary details, to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

**BASINGSTOKE, HAMPSHIRE. ROOKSDOWN HOUSE** PLASTIC AND JAW UNIT. Applications are invited for the appointment of SENIOR HOUSE OFFICER. National salary scale and conditions. Interesting work which includes plastic surgery of all varieties, war injuries, congenital abnormalities, and burns at all stages, in special "burns" centre.

Apply, stating experience and the names of 2 persons for reference, to the Medical Superintendent as soon as possible.

**BATH HOSPITAL MANAGEMENT COMMITTEE.** Applications are invited from medical practitioners for the post of RESIDENT HOUSE PHYSICIAN. The officer will, for the first 3 months, be based at the Royal National Hospital for Rheumatic Diseases (attached to which is the Rheumatism Research Unit of the South West and Oxford Regions) followed by 3 months at St. Martin's Hospital. The appointment is recognised for pre-registration purposes.

Applications, stating age, qualifications and experience, with 3 testimonials, should be forwarded to the Group Secretary, Manor Hospital, Combe Park, Bath, by 1st November, 1955.

**BEDFORD GENERAL HOSPITAL. (437 Beds.) Pre-**registration HOUSE SURGEON required for casualty and orthopædic duties.

Applications, stating age, nationality, qualifications, previous appointments (if any), together with copies of 2 recent testimonials, should be forwarded to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

**BEDFORD GENERAL HOSPITAL. (437 Beds.) North** WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required for busy acute Orthopædic and Traumatic Department at above Hospital. Previous orthopædic experience desirable. Candidates may visit Hospital by appointment with the Group Secretary.

Application forms obtainable from, and returnable to, Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, as soon as possible.

**BEDFORD GENERAL HOSPITAL. (437 Beds.) 2 resi-**dent Pre-registration HOUSE PHYSICIANS required middle December.

Applications, stating age, nationality, qualifications, previous appointments (if any), together with copies of 2 recent testimonials, should be forwarded to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, by not later than 14th November, 1955.

**BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL.** (229 Beds.) HOUSE SURGEON (first, second, or third post), vacant now. General surgical duties, some orthopædics. Offering good opportunity for general experience in busy acute General Hospital. Married quarters available. Recognised for F.R.C.S. Approved pre-registration post. Fully qualified practitioners may apply.

Applications to Group Secretary.

**BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL.** (229 Beds.) ORTHOPÆDIC HOUSE SURGEON (first, second, or third post). Offers good opportunity for general experience in busy acute general hospital. Approved pre-registration post. Fully qualified practitioners may apply. Recognised for F.R.C.S.

Apply to Group Secretary.

**BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL.** (229 Beds.) HOUSE PHYSICIAN. House Officer or Senior House Officer grading according to experience. Pre-registration post but fully qualified practitioners may apply.

Applications to Group Secretary.

**BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL.** (229 Beds.) Locum SENIOR HOUSE SURGEON required now. Salary £14 10s. per week. General surgical duties, some orthopædics. Married quarters available.

Applications to Group Secretary.

**BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. (780** Beds.) SENIOR HOUSE OFFICER required in Casualty Department (40,000 attendances per year). Resident or non-resident. Recognised for F.R.C.S. Tenable for 6 or 12 months. Vacant early November.

Detailed applications, with copies of 3 testimonials, to Secretary.

**BIRMINGHAM REGIONAL HOSPITAL BOARD.**

(1) **Birmingham (Dudley Road) Group, Birmingham, 18**

REGISTRAR (E.N.T. surgery) for Birmingham and Midland Ear and Throat Hospital. Resident. Recognised D.L.O. and F.R.C.S.

(2) **No. 20 Group, Stoney Stanton-road, Coventry**

(*a*) REGISTRAR (E.N.T. surgery). Duties mainly Coventry Hospitals (45 E.N.T. beds); some duties, Nuneaton and Rugby. Recognised F.R.C.S. and D.L.O. Hearing-aid Department. Non-resident.

(*b*) REGISTRAR (general surgery) for Coventry and Warwickshire Hospital (354 Beds—91 general surgery). Recognised F.R.C.S. Experience specialty essential. Vacant early December. Resident.

(3) **South Warwickshire Group, 50, Holly-walk, Leamington Spa**

REGISTRAR (general surgery) for Warneford Hospital (197 Beds). Resident. Experience specialty essential. Higher qualifications an advantage. Approved F.R.C.S.

(4) **Walsall Group, Wednesbury-road, Walsall**

REGISTRAR (general surgery) for Manor Hospital (333 Beds). Experience specialty essential. Married quarters available.

(5) **Stoke-on-Trent Group, Princes-road, Stoke-on-Trent**

REGISTRAR (psychiatry) resident or non-resident, for City General Hospital. Post offers exceptionally wide experience of all psychiatric treatment. The Department, which is an integral part of a fully equipped General Hospital, consists of 150 Beds, including 2 observation wards. The Unit is recognised for D.P.M. and the post carries 3 outpatient sessions.

Application forms from Group Secretaries, to be returned before 7th November, 1955. Candidates may visit hospitals.

**BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS.** THE BIRMINGHAM AND MIDLAND HOSPITAL FOR WOMEN, Showell Green-lane, SPARKHILL, BIRMINGHAM, 11. 2 RESIDENT GYNÆCOLOGICAL HOUSE SURGEONS required from 7th January, 1956. Posts recognised for M.R.C.O.G.

Application forms obtainable from the House Governor to be returned not later than 31st October, 1955.

**BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS.** THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER to work in the Clinical Pathological Department, vacant 7th November, 1955, for 1 year. Applicants should have held resident appointments in a children's hospital or a children's department of a general hospital.

Forms of application may be obtained from the House Governor and should be returned by 29th October, 1955.

G. A. PHALP, Secretary to the Board of Governors.

**BIRMINGHAM. SUMMERFIELD HOSPITAL, Western-road,** BIRMINGHAM, 18. JUNIOR HOSPITAL MEDICAL OFFICER required. Resident or non-resident. 1000 Beds for elderly and chronic sick and an active geriatric organisation. 4 Junior Hospital Medical Officers.

Applications, with copies of 3 recent testimonials, to Secretary Dudley Road Hospital, Birmingham, 18.

**BISHOP'S STORTFORD AND DISTRICT HOSPITAL,** Rye-street, BISHOP'S STORTFORD, HERTS. (67 Beds—medical, surgical and maternity. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited from registered medical practitioners for the appointment of RESIDENT SENIOR HOUSE OFFICER. Appointment to commence as soon as possible. Salary £745 p.a.

Applications, stating age, nationality, qualifications and experience, with copies of recent testimonials or names of referees, should be sent to the Hospital Secretary, Haymeads Hospital, Bishop's Stortford, Herts.

**BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE.** SENIOR HOUSE OFFICER (anæsthetics) required 22nd November, 1955, for duties throughout Group, mainly at Royal Infirmary, Blackburn. Residence at Queen's Park Hospital, Blackburn. Post recognised for D.A. and F.F.A. R.C.S.

Apply to Secretary of Committee, with names of 2 referees or copies of testimonials, Royal Infirmary, Blackburn.

**BLACKBURN. ROYAL INFIRMARY. (262 general beds.)** JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER (casualty and orthopædics) required immediately. Junior Hospital Medical Officer post can be for any period of up to 4 years and is recognised for F.R.C.S.

Apply to Secretary, Blackburn and District Hospital Management Committee, Hospital Management Committee Office, Royal Infirmary, Blackburn.

**BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE.**

**The Royal Infirmary, Bolton** (237 Beds)

JUNIOR HOSPITAL MEDICAL OFFICER for casualty/orthopædic duties. Appointment will be for a period of 4 years in the first instance.

RESIDENT SENIOR HOUSE OFFICER in Orthopædic Surgery. Tenable for 12 months and recognised for F.R.C.S.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees, to Group Secretary, The Royal Infirmary, Bolton.

**BOURNEMOUTH. ROYAL VICTORIA HOSPITAL,** WESTBOURNE. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER (anæsthetics) required for post vacant on 25th November. The post, which is recognised for the D.A. and F.F.A.R.C.S., is tenable for 12 months. Experience in Thoracic Unit available.

Applications to the Deputy Hospital Secretary, Royal Victoria Hospital, Shelley-road, Boscombe, Bournemouth.

**BRAINTREE, ESSEX. BLACK NOTLEY HOSPITAL.** Applications invited for the posts of HOUSE SURGEON and HOUSE PHYSICIAN. The successful applicant will serve 6 months as House Surgeon followed by 6 months as House Physician. First, second, third, or pre-registration posts. Surgical post includes duties in general surgical and gynæcological wards. Recognised for F.R.C.S. Medical post includes duties in medical and pædiatric wards.

Applications, with copies of 3 testimonials, to Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

**BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL.** (300 Beds.)

CASUALTY HOUSE SURGEON (1 of 3). Duties include work in Orthopædic and Traumatic Unit, vacant 1st November.

HOUSE SURGEON (including gynæcology), 8th November.

HOUSE SURGEON, 18th November.

Above posts recognised for pre-registration and F.R.C.S.

2 HOUSE PHYSICIANS, 16th November and 15th December, recognised for pre-registration.

Applications, stating usual particulars and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

**BRIGHTON. SUSSEX EYE HOSPITAL, Eastern-road,** BRIGHTON, 7. (56 Beds.) HOUSE SURGEON required by mid-November. Recognised for the F.R.C.S. and D.O., under 23 (*b*).

Applications, stating age, qualifications and experience, naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

**BRISTOL. COSSHAM/FRENCHAY HOSPITAL MANAGEMENT COMMITTEE.** FRENCHAY HOSPITAL. (513 Beds.) Applications are invited from registered practitioners for the post of SENIOR HOUSE OFFICER (medical). The appointment, which will be for 1 year in the first instance, is on the terms and conditions of service for hospital medical staff and is at a salary of £745, less a deduction of £145 p.a. in respect of unmarried accommodation provided at the Hospital. The candidate appointed will have general supervision under the Consultant staff of the 70 beds for general medicine and will be attached as a Clinical Assistant for occasional duties which may be required in the Regional Departments of Neurosurgery, Thoracic Surgery, and Plastic Surgery in the Hospital. As the Senior House Officer he will be in charge of the "House" and his duties will include pre-employment medical examinations of staff appointed by the Hospital Management Committee. It is customary for the resident nursing staff to be invited to register on the patients' panel of the Senior House Officer, who is entitled to retain the appropriate fees receivable.

Applications, containing details of qualifications and experience, together with the names of 2 referees, should be forwarded to the Group Secretary, Frenchay Hospital, Bristol, not later than 29th October, 1955.

**BRISTOL. HAM GREEN HOSPITAL, Pill, near Bristol.** Applications are invited for the post of RESIDENT ASSISTANT PHYSICIAN in the Infectious Diseases Department (350 Beds) of this Hospital. The Hospital contains a major Poliomyelitis Unit, a Tuberculous Meningitis Treatment Centre, and offers wide experience in acute medicine. Salary and conditions on Junior Hospital Medical Officer scale.

Applications, stating age, qualifications, &c., to the Resident Physician.

**BRISTOL (near). HAM GREEN HOSPITAL, Pill, near** BRISTOL. Applications are invited for the post of HOUSE OFFICER in the tuberculosis wards (188 Beds) of the above Hospital. The Hospital is fully equipped for the modern treatment of pulmonary tuberculosis including regular major thoracic surgery.

Apply Secretary, Ham Green Hospital, Pill, near Bristol.

**BRISTOL MENTAL HOSPITAL MANAGEMENT COMMITTEE.** BARROW AND FISHPONDS HOSPITALS. Applications invited from registered medical practitioners for appointment as SENIOR HOUSE OFFICER. Experience in general medicine or neurology an advantage. The Group includes Modern Admission Units, Neurosis Centre and Day Hospital, with Departments of Applied Psychology, Electro-encephalography, and Biochemical Research. The appointment offers opportunities for experience in many aspects of acute and chronic psychiatric illness.

Applications, giving details of experience, and names of 3 referees, should be sent to Medical Superintendent, Barrow Hospital, Barrow Gurney, near Bristol.

**BROMLEY GROUP HOSPITAL MANAGEMENT COMMITTEE.** SENIOR HOUSE OFFICER in Anæsthetics (qualified minimum 1 year) for duty at group hospitals, residing at Bromley Hospital, required immediately for 12 months. Recognised for D.A. and F.F.A.R.C.S. Deduction for residence £150 p.a.

Apply, naming 3 referees, to Administrative Officer, Bromley Hospital, Kent.

**BURTON-ON-TRENT GENERAL HOSPITAL. (251** Beds.) Locum HOUSE SURGEONS required at above Hospital.

Applications to Group Secretary.

**BURTON-ON-TRENT GENERAL HOSPITAL. (251** Beds.) HOUSE SURGEON required immediately. Pre-registration post.

Applications to the Group Secretary at the Hospital.

**CHERTSEY, SURREY. ST. PETER'S HOSPITAL** (late Botley's Park War Hospital). (430 Beds.) ORTHOPÆDIC HOUSE SURGEON required from 24th October, 1955, Senior House Officer or House Officer (intern) grade. Post recognised for F.R.C.S. and Pre-registration Service, and preference given to provisionally registered candidates. Salary in accordance with terms and conditions of National Health Service.

Applications, together with names and addresses of referees, to be sent to the Physician-Superintendent, St. Peter's Hospital, as soon as possible.

**BLACKPOOL. VICTORIA HOSPITAL. (348 Beds.)** SENIOR HOUSE OFFICER (anæsthetics). Post recognised for the F.F.A.R.C.S. This is a busy general hospital offering a sound and varied experience in anæsthetics.

Applications, giving age, qualifications, experience, and the names and addresses of 2 referees, should be sent to the Hospital Secretary.

**CANTERBURY. KENT AND CANTERBURY HOSPITAL.** (277 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (casualty), which is now vacant. Salary £745 p.a. Recognised for the F.R.C.S.

Applications to be sent to the Hospital Secretary at the above Hospital, together with copies of 3 recent testimonials.

**CARDIFF (near). CAERPHILLY DISTRICT HOSPITAL.** (170 Beds—general surgery and medicine, orthopædic, gynæcology, ophthalmology, obstetrics, E.N.T.) RHYMNEY AND SIRHOWY VALLEYS HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEONS (pre-registration candidate if available) required (1 immediately and the other on 24th October) at above Hospital. Salary £425–£525 plus £50 special allowance. Married quarters available 24th October.

Apply, stating age, qualifications, &c., and the names of 2 referees, to the Group Secretary, Rhymney and Sirhowy Valleys Hospital Management Committee Central Offices, Caerphilly-road, Ystrad Mynach.

**CHEPSTOW, MONMOUTHSHIRE. PLASTIC SURGERY, JAW INJURIES AND BURNS CENTRE, ST. LAWRENCE HOSPITAL.** (109 plastic surgery, 50 orthopædic beds.) SENIOR HOUSE OFFICER in Plastic Surgery required. Previous experience in specialty not essential. The Hospital intakes from most of Wales and the successful candidate will receive a thorough training. Second Senior House Officer in plastic surgery recently appointed and there is also a Senior House Officer in orthopædics, Senior Registrar non-resident, and 2 Registrars, all in plastic surgery, resident. Salary £745, less £150 board-residence.

Write, quoting 2 referees, to T. A. JONES, Group Secretary. 64, Cardiff-road, Newport, Mon.

**CHESTER ROYAL INFIRMARY.** Applications are invited for the post of RESIDENT or NON-RESIDENT CASUALTY OFFICER (Junior Hospital Medical Officer). The duties of this post, which is recognised for the F.R.C.S., will include supervision of the Hand Clinic and work in the Orthopædic and Accident Departments.

Applications, together with the names and addresses of 2 referees, should be forwarded to the Group Secretary, XIII Chester and District Hospital Management Committee, 5, King's-buildings, Chester.

**CHICHESTER. ROYAL WEST SUSSEX HOSPITAL.** (202 acute beds.) RESIDENT HOUSE SURGEON required for 6 months appointment. National salary scale for first, second, or third posts. Post approved for pre-registration practitioners. Post recognised for F.R.C.S. 7 residents including Resident Surgical Officer and 3 House Surgeons. Vacant from 27th November, 1955.

Apply to Senior Administrative Officer.

**COLCHESTER. ESSEX COUNTY HOSPITAL. (188** Beds.) Applications invited for post of SENIOR HOUSE OFFICER (casualty and radiotherapy). Post tenable for 6 months or 1 year. Recognised for F.R.C.S.

Applications, with copies of 3 testimonials, to Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

**COTTINGHAM. CASTLE HILL SANATORIUM, Cottingham** (221 Beds), and RAYWELL SANATORIUM, near COTTINGHAM (48 Beds). SENIOR HOUSE OFFICER (or LOCUM TENENS) to work under supervision of Consultant Chest Physician in Group Sanatoria with Major Thoracic Surgery Unit and Mass Radiography and laboratory facilities.

Application forms from Group Secretary, Hull B Hospital Management Committee, De la Pole Hospital, Willerby, E. Yorkshire.

**CROYDON GENERAL HOSPITAL. (200 Beds.) Casualty** OFFICER (Senior House Officer—resident) commencing immediately. Post is recognised for Final F.R.C.S. examination.

Application forms obtainable from GEORGE A. PAINES, Secretary, Hospital Management Committee, General Hospital, Croydon, to be returned immediately.

**CROYDON GENERAL HOSPITAL. (200 Beds.) House** SURGEON (pre-registration) required as from 16th November for period of 6 months. Post recognised for F.R.C.S.

Application forms obtainable from GEORGE A. PAINES, Secretary, Hospital Management Committee, General Hospital, Croydon, to be returned immediately.

**CROYDON. MAYDAY HOSPITAL. (618 Beds.) Locum** Tenens JUNIOR CASUALTY OFFICER (Senior House Officer grade) required for period 27th October–9th November inclusive.

Full particulars, giving qualifications and experience, to—
GEORGE A. PAINES, Secretary,
Croydon Group Hospital Management Committee.
General Hospital, Croydon.

**CROYDON. MAYDAY HOSPITAL. (618 Beds.) House** PHYSICIAN (pre-registration) for a period of 6 months from 17th November.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Croydon Group Hospital Management Committee, General Hospital, Croydon, to be returned as soon as possible.

**DEWSBURY, YORKSHIRE. THE GENERAL HOSPITAL.** (128 Beds.)

HOUSE PHYSICIAN (medicine and pædiatrics).

HOUSE OFFICER (surgery and E.N.T.).

Applications are invited for the above pre-registration posts which are available for 6 months from 1st November, 1955.

Applications, stating full details, should be sent to the Administrative Officer at the Hospital not later than 26th October, 1955.

**CARSHALTON, SURREY. ST. HELIER HOSPITAL.** ANÆSTHETIC REGISTRAR. The Hospital is recognised for the F.F.A.R.C.S. and D.A.

Forms of application, returnable by 4th November, from the Group Secretary at above address.

**DOUGLAS, I.O.M. NOBLE'S ISLE OF MAN HOSPITAL.** (160 Beds.) Applications are invited for the post of HOUSE SURGEON. The post is recognised for pre-registration purposes, and is now vacant. 4 residents on the staff. Salary £425–£475–£525 according to experience. A deduction of £125 a year for residential emoluments. Appointment for 6 months.

Apply immediately, giving full particulars and copies of 2 recent testimonials or names and addresses of 2 referees, to the Secretary, Noble's Isle of Man Hospital, Douglas.

**DRIFFIELD, YORKSHIRE. EAST RIDING GENERAL** HOSPITAL. (247 Beds.) HOUSE PHYSICIAN (first, second, or third post), vacant 4th November. Approved pre-registration post. Fully qualified practitioners may apply. Duties to include acute and chronic sick and casualties. Good general experience for first house appointment.

Apply Group Secretary, Westwood Hospital, Beverley, Yorkshire.

**DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL** GROUP, BIRMINGHAM REGION.

**The Corbett Hospital, Stourbridge** (106 Beds)

SENIOR HOUSE OFFICER (casualty).

**The Guest Hospital, Dudley** (154 Beds)

SENIOR HOUSE OFFICER (casualty). Post recognised for F.R.C.S. examination.

SENIOR HOUSE OFFICER (anæsthetics). Post now vacant.

SENIOR HOUSE OFFICER (surgical). Post now vacant.

**Wordsley Hospital, near Stourbridge** (478 Beds)

SENIOR HOUSE OFFICER (anæsthetics). Resident. Previous experience house appointments essential. Experience available general surgery, gynæcology, orthopædics, plastic surgery unit.

Applications, stating age, experience, with copies of 3 recent testimonials, to Group Secretary, The Guest Hospital, Dudley, Worcs.

**EAST ANGLIAN REGIONAL HOSPITAL BOARD.** SENIOR REGISTRAR in Psychiatry, East Suffolk Mental Hospitals. St. Clement's Hospital, Ipswich (450 Beds), and St. Audry's Hospital, Melton, near Woodbridge (1100 Beds), and associated General Hospital outpatient clinics. There is a very active Outpatient Department and Electro-encephalographic Department at St. Clement's Hospital. Trainee post. Both hospitals are recognised for the D.P.M.

Applications, stating age, experience, and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 7th November, 1955. Candidates invited to visit hospitals by direct arrangement with Medical Superintendent, St. Audry's Hospital.

**EAST ANGLIAN REGIONAL HOSPITAL BOARD.**

(1) REGISTRAR in E.N.T. Surgery, Norfolk and Norwich Hospital and Jenny Lind Children's Hospital, Norwich. Post recognised for D.L.O. and F.R.C.S. Appointment for 1 year, renewable for second year. Candidates are invited to visit Hospital by direct arrangement with the Hospital Management Committee Secretary, Norfolk and Norwich Hospital.

(2) RADIOLOGICAL REGISTRAR, Ipswich and East Suffolk Hospital (Anglesea Road Wing). The department is the centre for consultant radiological services for the Ipswich Hospital Group. Post recognised for D.M.R.D. Part II examination. Appointment for 1 year, renewable for second year.

(3) SURGICAL REGISTRAR, North Cambridgeshire Hospital, Wisbech. Post provides good training and experience in both general and orthopædic surgery. Appointment for 1 year, renewable for second year.

(4) ORTHOPÆDIC REGISTRAR, Norfolk and Norwich Hospital (441 Beds). Post provides excellent training. Appointment for 1 year, renewable for second year.

Candidates invited to visit hospitals (2, 3, and 4), by direct arrangement with Hospital Management Committee Secretaries at the hospitals.

Applications, stating age, experience and the names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 31st October, 1955.

**EPPING. ST. MARGARET'S HOSPITAL. (485 Beds.)** RESIDENT SENIOR HOUSE OFFICER (surgery) as Casualty Officer and Orthopædic House Surgeon. Post vacant 2nd November, 1955. Recognised training post for F.R.C.S. Busy general hospital with easy access to London. Salary on national scale, less deduction for board, lodging, &c.

Applications, with copies of 2 recent testimonials, to the Group Secretary, Epping Group Hospital Management Committee, St. Margaret's Hospital, Epping, Essex, by 26th October, 1955.

**ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL.** Applications are invited for the post of RESIDENT PATHOLOGIST (Senior House Officer grade) for duties in the area Laboratory and at other hospitals in the Group. The area Laboratory is recognised for the Diploma of Pathology of the Royal Colleges of Physicians and Surgeons. Further information can be obtained from the Senior Pathologist. Appointment tenable for 1 year.

Applications, with the names of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, immediately.

**ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL.** ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER required in the Department of Anæsthesia, vacant 23rd November, 1955. 12 months appointment. The post is recognised for the D.A. and F.F.A.R.C.S. and affords a wide range of practical experience and tuition under Consultant supervision.

Applications, giving names and addresses of 2 referees, to the Group Secretary.

**ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL.** SENIOR HOUSE OFFICER for casualty duties required 27th December, 1955. Non-resident post. Recognised by Royal College of Surgeons for the Final Fellowship examination. 12 months appointment. Hours : 9 A.M.–5.30 P.M. Monday–Friday ; 9 A.M.–1 P.M. Saturday.

Applications, with the names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee.

**ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL.** Appointment of RESIDENT HOUSE SURGEON (third post), vacant 16th December, 1955. Duties with General Surgical Unit which includes some orthopædics. 6 months appointment. Post recognised by the Royal College of Surgeons.

Applications, with the names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee.

**EDGWARE GENERAL HOSPITAL, Edgware, Middlesex.** (715 Beds.) 2 RESIDENT HOUSE SURGEONS. Posts vacant 14th and 17th November, 1955. 6 months appointments. Posts recognised for F.R.C.S. and pre-registration purposes.

Applications, stating age, qualifications, experience and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 29th October, 1955.

**EXETER. ROYAL DEVON AND EXETER HOSPITAL.** EXETER AND MID-DEVON HOSPITALS MANAGEMENT COMMITTEE. Applications are invited from pre-registration and registered medical practitioners for the post of HOUSE SURGEON, vacant 27th November, 1955.

Applications with copies of 2 recent testimonials, to the Hospital Secretary, by 29th October, 1955.

**GLASGOW ROYAL INFIRMARY. Junior Hospital** MEDICAL OFFICER in Radiotherapy. Duties at above Infirmary.

Write not later than 29th October, 1955, giving 3 names for reference, to the Secretary, Board of Management for Glasgow Royal Infirmary and Associated Hospitals, 135, Buchanan-street, Glasgow, C.1.

**GREAT YARMOUTH AND GORLESTON GENERAL** HOSPITAL, DENE SIDE, GREAT YARMOUTH. HOUSE SURGEON (Male or Female) required. Post vacant 1st November, 1955. The Hospital is staffed by a Consultant General Surgeon and a Consultant E.N.T. Surgeon, and is regularly visited by Consultant staff from the Norfolk and Norwich Hospital. The post is a pre-registration post at a salary of £425, £475, or £525 p.a. according to experience, less £125 p.a. for residence. Membership of a Medical Defence Society is a condition of appointment.

Applications, stating age, qualifications, and experience, with names of 2 referees, to Hospital Secretary.

**GUILDFORD. ROYAL SURREY COUNTY HOSPITAL.** (232 Beds.) RESIDENT HOUSE SURGEON required for general surgery. Post is vacant on 21st November and tenable for 6 months. It is approved for pre-registration practitioners and recognised for the F.R.C.S. examination.

Applications, with copies of 3 testimonials, should be sent to the Hospital Secretary as soon as possible.

**HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST** HERTS HOSPITAL. (170 Beds.) HOUSE PHYSICIAN (pre-registration) required. Post vacant 1st December, 1955.

Applications, giving full details and names of 2 referees, should be sent to the Hospital Secretary.

**HITCHIN. LISTER HOSPITAL. (330 Beds.) North** WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time MEDICAL REGISTRAR (resident) required at above Hospital. Post gives good all-round experience, valuable for the M.R.C.P. Vacant 1st January, 1956. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, Luton and Hitchin Hospital Management Committee, St. Mary's Hospital, Luton, Beds, 31st October, 1955.

**HOUNSLOW HOSPITAL, Staines-road, Hounslow,** MIDDLESEX. (General Acute—81 Beds.) Applications are invited for the appointment of RESIDENT HOUSE SURGEON. Recognised pre-registration appointment for 6 months. Vacant 22nd November, 1955.

Applications, stating qualifications and age, together with copies of up to 3 recent testimonials, or names for reference, to the Hospital Secretary.

**HUDDERSFIELD ROYAL INFIRMARY. (312 Beds.)** HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from provisionally registered or registered medical practitioners for the post of HOUSE PHYSICIAN to commence duties immediately. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.

The Royal Infirmary, Huddersfield.

**HUNTINGDON COUNTY HOSPITAL. Applications** are invited for the post of HOUSE OFFICER (surgical) becoming vacant beginning November. Post recognised for pre-registration purposes.

Apply, with full particulars and names of 2 referees, to Group Secretary, Hospital Management Committee Offices, Newmarket General Hospital, Newmarket.

**ILFORD. KING GEORGE HOSPITAL. There will be** a vacancy for a CASUALTY OFFICER at the above Hospital on 12th December, 1955, at a salary of £745 p.a., less £145 p.a. emoluments. Senior House Officer grade. This post is recognised for the F.R.C.S.

Applications, giving full particulars and accompanied by testimonials, should be sent to the undersigned within 7 days of the appearance of this advertisement.

H. G. HARRIS, Group Secretary,
Ilford and Barking Group Hospital Management Committee.
King George Hospital, Ilford.

**IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea** ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE SURGEON to the General Consulting Surgeon. The post is recognised for pre-registration and for the F.R.C.S. examinations.

Applications, with copies of recent testimonials, to Hospital Secretary.

**IPSWICH AND EAST SUFFOLK HOSPITAL (Heath** ROAD WING), IPSWICH. (270 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (Fracture and Orthopædic Department). The post is normally of 1 years duration. It is recognised as part of the necessary surgical experience for the Final F.R.C.S.

Applications, stating age, qualifications, and experience, together with recent testimonials, to the Hospital Secretary.

**IPSWICH AND EAST SUFFOLK HOSPITAL (Heath** ROAD WING), IPSWICH. (270 Beds.) Applications invited for post of HOUSE SURGEON (House Officer) to General Surgeons vacant on 27th October, 1955. Pre-registration post, 6 months duration, recognised for R.C.S. examinations.

Applications, stating age, experience, and qualifications, with copies of recent testimonials, to Hospital Secretary.

**ISLEWORTH. WEST MIDDLESEX HOSPITAL. North** WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR in Pædiatric Department required—whole-time. Previous pædiatric experience essential. Duties include work in Children's Unit (90 Beds), Neonatal Unit and Pædiatric Outpatient Clinics. Vacant 1st January, 1956. Candidates may visit Hospital by appointment with Medical Director.

Application forms obtainable from, and returnable to, Secretary, South West Middlesex Group Hospital Management Committee, West Middlesex Hospital, Isleworth, by 4th November, 1955.

**ISLEWORTH. WEST MIDDLESEX HOSPITAL. House** OFFICER (pre-registration) for General Medicine.

Applications, stating age, nationality, qualifications obtained with copies of up to 2 recent testimonials, to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 31st October, 1955.

**ISLEWORTH. WEST MIDDLESEX HOSPITAL. Senior** HOUSE OFFICERS (2) required for Admissions and Casualty Department. Must have held medical and surgical posts.

Applications, stating age, nationality, qualifications and experience, with copies of up to 3 recent testimonials, to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 5th November, 1955.

**KINGSTON HOSPITAL, Wolverton-avenue, Kingston-** UPON-THAMES. KINGSTON GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from suitably qualified and experienced medical officers for the post of SENIOR HOUSE OFFICER (casualty and orthopædic), recognised for 6 months casualty service for F.R.C.S., which is vacant on 1st December, 1955.

Applications, stating age, qualifications and experience, together with 2 recent testimonials, should reach the Physician-Superintendent of the Hospital by 29th October.

**LEICESTER ISOLATION HOSPITAL AND CHEST** UNIT, Groby-road, LEICESTER. (328 Beds.) Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER (surgical). Salary £745 p.a., less £150 p.a. residential emoluments. The appointment is tenable for 6 months and may be extended for a further period of 6 months. Experience will be gained in all branches of thoracic surgery, including cardiac surgery. The post is recognised for the Final Fellowship.

Applications, giving age, qualifications, dates, &c., and copies of 2 recent testimonials, to be forwarded as soon as possible to the Department of Thoracic Surgery, Leicester Isolation Hospital and Chest Unit.

**LEICESTER ROYAL INFIRMARY. Applications are** invited for the pre-registration post of HOUSE SURGEON vacant immediately. Recognised for F.R.C.S.

Applications, stating age and qualifications, with copies of recent testimonials, to the Group Secretary, No. 1 Hospital Management Committee, The Leicester Royal Infirmary, forthwith.

**LOUTH, LINCOLNSHIRE. COUNTY INFIRMARY.** (215 Beds.) GRIMSBY HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (orthopædic and casualty), now vacant at this General Hospital.

Applications, giving full details, together with the names of 2 referees, should be addressed to the Hospital Secretary.

**LEEDS A GROUP HOSPITAL MANAGEMENT COM-** MITTEE. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER (anæsthetics) for duties mainly at St. James's Hospital. The appointment which is recognised for the D.A. and the F.F.A.R.C.S. will be for a period of 1 year, and the salary will be in accordance with the agreed terms and conditions of service of hospital medical staff, namely £745 p.a., with an appropriate deduction in respect of board, lodging, and other services provided.

Applications, stating age, qualifications, experience, &c., together with the names of 2 referees, to be forwarded to the undersigned as soon as possible.

J. FOLKARD, Secretary to the Committee.

Administrative Offices, St. James's Hospital, Leeds, 9.

**LEEDS, 7. CHAPEL ALLERTON HOSPITAL. (256** Beds.) MEDICAL REGISTRAR required for whole-time duty. National Health Service terms and conditions of service.

Detailed applications (9 copies), giving nationality, date of birth, qualifications, and experience, including present appointments and the names of 3 referees, should reach the Secretary, Ministry of Health, Norcross, Blackpool, Lancashire, by 12th November, 1955.

**LEEDS REGIONAL HOSPITAL BOARD.** Registrar vacancies.

*Chest Diseases*

Castle Hill Sanatorium, Cottingham, East Yorks (220 Beds) (resident).

*General Medicine*

Regional Rheumatism Centre, Harrogate (240 Beds) (9 sessions), and the Rheumatism Clinic, General Infirmary at Leeds (2 sessions). Resident at Royal Bath Hospital, Harrogate.

*General Surgery*

(*a*) Hull Royal Infirmary (80 general surgical beds) and other hospitals in the Hull A Group. Non-resident. Includes additional duties in Casualty Department.

(*b*) St. James's Hospital, Leeds (140 general surgical beds).

*Obstetrics and Gynæcology*

(*a*) Leeds A Group. Duties to alternate (6-month periods) between St. Mary's Hospital, Leeds (109 obstetric beds), and St. James's Hospital, Leeds (74 obstetric and 52 gynæcological beds). Resident. Recognised for M.R.C.O.G.

(*b*) Wakefield A and B Groups (with occasional duties in Pontefract and Goole Groups). Non-resident. Offers good experience but is not at present recognised by the R.C.O.G. for membership purposes. (Aggregate of 120 obstetric and 50 gynæcological beds.)

(*c*) Dewsbury, Batley and Mirfield Group (resident). Not yet recognised for M.R.C.O.G. but offers good experience. (Aggregate of 90 obstetric and 30 gynæcological beds.)

*Otolaryngology*

Hull Royal Infirmary and associated hospitals (50 E.N.T. beds) (non-resident).

*Psychiatry*

(*a*) Menston Hospital, near Leeds (2500 Beds) (resident).

(*b*) De la Pole Hospital, Willerby (1175 Beds), and associated clinics (resident or non-resident).

(*c*) Broadgate Hospital, Beverley (600 Beds). Accommodation for single person. Resident or non-resident.

If desired, facilities for attendance at the Leeds University will be provided if successful candidates are studying for the D.P.M.

*Thoracic Surgery*

Duties at the Thoracic Surgical Units at the Bradford Royal Infirmary and The Hospital, Middleton. (Aggregate of 65 Beds for both non-tuberculous and tuberculous cases.) Non-resident.

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 3rd November, 1955.

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**LEEDS. THE UNITED LEEDS HOSPITALS.** The GENERAL INFIRMARY AT LEEDS. HOUSE OFFICER—Senior or Junior (pre- or post-registration)—required for Department of Urology. Post tenable for 6 months from 1st November, 1955. Salary according to grade. Terms and conditions of service for hospital medical staff apply.

Applications, giving age, qualifications, previous posts (if any) with dates, and 3 names for reference, to be sent to the Secretary to the Board.

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**LEEDS. THE UNITED LEEDS HOSPITALS.** The GENERAL INFIRMARY AT LEEDS. Applications are invited for the following pre-registration appointments which are tenable for 6 months from 1st November, 1955.

HOUSE PHYSICIAN to the Dermatological Department.

HOUSE SURGEON to the Ophthalmology Department.

Terms and conditions of service for hospital medical staff apply.

Applications, with details of age, education, qualifications, previous posts (if any) with dates, should be sent to the Secretary to the Board as soon as possible.

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**LINCOLN. COUNTY HOSPITAL.** Locum Tenens House PHYSICIAN required at the above Hospital for the period 1st December, 1955–31st March, 1956.

Applications, giving full particulars, should be forwarded to—

R. W. HOWICK, Esq., Group Secretary.

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**LUTON AND DUNSTABLE HOSPITAL, Luton, Bedfordshire.** SENIOR HOUSE OFFICER (resident) in Medicine with certain duties in Pathology required. Vacant 21st November.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Secretary by 8th November, 1955.

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**MAIDSTONE. KENT COUNTY OPHTHALMIC AND AURAL HOSPITAL.** (113 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE SURGEON in the Ophthalmic Department of the above Hospital. The Hospital is recognised by the Examining Boards for the F.R.C.S. and the D.L.O. Appointment will be for 12 months. Salary £745 a year, less £150 a year for residential emoluments.

Applications should be forwarded as soon as possible to the Administrative Officer, Kent County Ophthalmic and Aural Hospital, Church-street, Maidstone.

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**MAIDSTONE. WEST KENT GENERAL HOSPITAL.** (141 Beds.) MID KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RECEIVING ROOM OFFICER. Salary £745 a year, with a deduction of £150 a year for residential emoluments.

Applications to the Administrative Officer at the Hospital as soon as possible.

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**MARGATE. ROYAL SEA BATHING HOSPITAL.** (Surgical Tuberculosis and Orthopædics, 241 Beds.) SENIOR HOUSE OFFICER. This post, now vacant, is largely an orthopædic one, and affords experience in the treatment of tuberculous and non-tuberculous orthopædic conditions. There is also a genito-urinary unit of 35 beds and a small number of beds for other tuberculous conditions. The post is suitable for someone reading for a higher surgical examination. Salary £745 p.a., less £150 for residential emoluments.

Applications, with copies of testimonials, to be sent to the Hospital Secretary.

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**MANCHESTER. CHRISTIE HOSPITAL AND HOLT RADIUM INSTITUTE, WITHINGTON, MANCHESTER, 20.** SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER (radiotherapy) at the above Hospital, commencing immediately. Training will be available from April, 1956, for Diploma in Radiotherapy Course.

Applications, with full details, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, immediately.

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**MANCHESTER. CRUMPSALL HOSPITAL.** Applications are invited for the post of REGISTRAR in Obstetrics and Gynæcology at the above Hospital. Recognised for M.R.C.O.G. This post offers extensive clinical experience.

Applications, with full details and names of 3 referees, to Group Secretary, North Manchester Hospital Management Committee, Crumpsall Hospital, Manchester, 8.

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**MANCHESTER 19. DUCHESS OF YORK HOSPITAL FOR BABIES.** SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN (Male or Female) required for 6 months at the above Hospital which is associated with the Manchester University for teaching purposes.

Applications, with copies of 3 testimonials, to be forwarded to the Administrative Officer of the Hospital immediately.

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**MANCHESTER REGIONAL HOSPITAL BOARD.** Senior REGISTRAR in General Medicine in the South Manchester Group of hospitals, mainly at Withington Hospital, Manchester. M.R.C.P. desirable. Arrangements may later be made for the person appointed to transfer to the United Manchester Hospitals (Manchester Royal Infirmary) for further experience and training.

Application forms, obtainable from the Senior Administrative Medical Officer, Cheetwood-road, Manchester, 8, should be returned by 31st October, 1955.

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**MANCHESTER REGIONAL HOSPITAL BOARD** invite applications for REGISTRAR in Psychiatry (resident or non-resident) for duties in the Wigan and Leigh Group. The person appointed will assist the Consultant Psychiatrist at consultative clinics, and with inpatient treatments, &c. The main centre is at Billinge Hospital where there is an active Psychiatric Unit with all modern treatments. Over 300 admissions annually. Good training facilities are available for anyone desiring to specialise in psychiatry. The post is recognised for D.P.M.

Applications, together with names of 2 referees, to the Secretary, Wigan and Leigh Hospital Management Committee, Knowsley House, Wigan.

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**MANCHESTER REGIONAL HOSPITAL BOARD.** Applications are invited for a post of REGISTRAR in the Obstetric and Gynæcology Department in the Barrow and Furness Group of hospitals, available about 1st February, 1956. 72 obstetric/gynæcological beds in main unit; outpatient departments and extensive surgical experience. Recognised for D.Obst.R.C.O.G.

Applications to Group Secretary, Barrow and Furness Hospital Management Committee, 52, Paradise-street, Barrow-in-Furness, not later than 27th October, 1955.

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**MANCHESTER. UNITED MANCHESTER HOSPITALS.** MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. SENIOR HOUSE OFFICER to a General Medical Unit, to commence as soon as possible. Whole-time non-resident post, tenable for 6 months, renewable for a second and possibly a third 6 months.

Application forms obtainable from the undersigned, to be returned by 5th November, 1955. G. H. TAYLOR, Secretary.

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**MANCHESTER. UNITED MANCHESTER HOSPITALS.** MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13.

5 HOUSE PHYSICIANS.
HOUSE PHYSICIAN for Department of Cardiology.
HOUSE PHYSICIAN for Department of Hæmatology.
8 HOUSE SURGEONS.
2 HOUSE SURGEONS for E.N.T. Department.
2 HOUSE SURGEONS for Neurosurgical Department.
3 HOUSE SURGEONS for Orthopædic Department.

Appointments are for 6 months from 15th and 22nd January, 1956, at the appropriate salaries for House Officer appointments, with a deduction of £125 p.a. for residence.

Application to be made on form obtainable from the undersigned and to be returned as soon as possible.

G. H. TAYLOR, Secretary.

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**MANCHESTER. UNITED MANCHESTER HOSPITALS.** SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited for the post of SENIOR HOUSE OFFICER in Obstetrics. Applicants must have had previous hospital experience in general medicine and surgery, and in obstetrics. The post is recognised for purposes of the M.R.C.O.G. examination. The duties involve clinical responsibility for mothers and babies, and supervision of the work of pre-registration House Officers is also included. The appointment is for 12 months from 1st January, 1956. National scale.

Application forms may be obtained from the undersigned and returned not later than 14th November, 1955.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

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**MANCHESTER. WEST MANCHESTER HOSPITAL** MANAGEMENT COMMITTEE. The following staff are required :—

**Park Hospital, Davyhulme** (General Hospital—433 Beds)

1 SENIOR HOUSE OFFICER (general surgery), vacant mid-November.

1 NON-RESIDENT SECOND ASSISTANT CLINICAL PATHOLOGIST (Senior House Officer grade), now vacant.

1 HOUSE OFFICER (general surgery). Pre-registration post. Recognised for F.R.C.S. Vacant November.

**Eccles and Patricroft Hospital** (General Hospital—48 Beds)

1 SENIOR HOUSE OFFICER required. The work of the Hospital is mainly surgical. There is a busy Outpatient Department. Now vacant.

Forms from Secretary, Park Hospital, Davyhulme.

**MANSFIELD AND DISTRICT GENERAL HOSPITAL.** (205 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT MEDICAL REGISTRAR required. Post vacant 4th January, 1956. This post offers experience in general medicine and pædiatrics. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 31st October, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

**NEWARK HOSPITAL, Newark. (82 Beds.) Sheffield** REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SURGICAL OFFICER with general duties required at Registrar rate of pay. This post offers good experience to anyone preparing to enter General Practice. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 31st October, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

**NEWMARKET GENERAL HOSPITAL, Newmarket,** SUFFOLK. Applications invited for the post, now vacant, of SENIOR HOUSE OFFICER (orthopædic and casualty duties).

Applications, with 3 testimonials, to the Physician-Superintendent.

**NEWPORT, MONMOUTHSHIRE. ROYAL GWENT** HOSPITAL. (260 Beds. Recognised F.R.C.S.) SENIOR HOUSE OFFICER required for Casualty Department, early November. Resident or non-resident. This is the Group's base Hospital, and all medical and surgical emergencies are admitted through casualty, which is under the full-time charge of a Senior Hospital Medical Officer, and there is also another Senior House Officer. A new department with excellent facilities has recently been opened. Post recognised F.R.C.S. for 6 months, and tenable 6 or 12 months as desired. Salary £745, less £125 for board-residence, if resident.

Write, quoting 2 referees, to T. A. JONES, Group Secretary 64, Cardiff-road, Newport, Mon.

**NEWCASTLE REGIONAL HOSPITAL BOARD.**

**South Shields Hospital Management Committee**

REGISTRAR SURGEON (whole-time), at Ingham Infirmary. Single accommodation available.

REGISTRAR ANÆSTHETIST (whole-time). Post recognised for F.F.A.R.C.S. Accommodation available.

**North West Durham Hospital Management Committee**

REGISTRAR PHYSICIAN (whole-time) at Shotley Bridge Hospital (557 Beds), single accommodation available. Appointment to commence 1st January, 1956.

**Regional Cancer Service** (Main hospitals: Newcastle General, Shotley Bridge General)

REGISTRAR RADIOTHERAPIST (whole-time). Accommodation may be available.

Applications, with names and addresses of 3 referees, to be forwarded to Senior Administrative Medical Officer, Newcastle Regional Hospital Board, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

**NORTHWOOD, MIDDLESEX. MOUNT VERNON HOS-**PITAL AND RADIUM INSTITUTE. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR (resident) required at above Hospital which may be visited by direct appointment.

Application forms obtainable from, and returnable to, the Group Secretary, Harefield and Northwood Group Hospital Management Committee, Mount Vernon Hospital, Northwood, Middlesex, by 1st November, 1955.

**NORTHWOOD, MIDDLESEX. MOUNT VERNON** CENTRE FOR PLASTIC AND JAW SURGERY, MOUNT VERNON HOSPITAL. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. DENTAL REGISTRAR required at above Centre. All types of fracture, maxillo-facial and oral surgical cases are treated and it is expected that the successful candidate will hold, or have commenced study for, a higher qualification. Whole-time appointment subject to confirmation after 6 months. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, the Group Secretary, Harefield and Northwood Group Hospital Management Committee, Mount Vernon Hospital, Northwood, Middlesex, by 22nd November, 1955.

**NORWICH. NORFOLK AND NORWICH HOSPITAL.** Locum ORTHOPÆDIC REGISTRAR required immediately. Salary £17 10s. per week in accordance with Ministry of Health terms and conditions of service. Membership of a Medical Defence Society is a condition of appointment.

Applications, stating age, qualifications and experience, together with names of 2 referees, to Secretary, Hospital Management Committee, St. Stephen's-road, Norwich.

**NOTTINGHAM GENERAL HOSPITAL. Applications** are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER (casualty). Duties to commence 1st November. Establishment 3. Recognised for the F.R.C.S. Post offers wide experience of casualty work.

Applications, stating age, nationality, qualifications and experience, together with copies of testimonials, to be sent to the Secretary, General Hospital, Nottingham.

**NOTTINGHAM. CITY HOSPITAL. (804 Beds.) Sheffield** REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (thoracic surgery) required. Appointment for 1 year in first instance. Thoracic Unit at City Hospital undertakes non-tuberculous and cardiological cases; tuberculosis surgery undertaken at modern unit in nearby Sanatorium, appointee encouraged to attend. Previous thoracic surgical experience desirable.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 31st October, 1955, giving age, nationality, present and previous appointments with dates, naming 3 referees.

**NOTTINGHAM. CITY HOSPITAL. (804 Beds.) Appli**cations are invited for the post of HOUSE SURGEON, vacant 15th November, 1955. Recognised for pre-registration purposes.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

**NOTTINGHAM. CITY HOSPITAL. (804 Beds.) Applica**tions are invited for the post of SENIOR HOUSE OFFICER to the Department of Thoracic Surgery. Post vacant 1st December, 1955. Salary £745 p.a., less £150 p.a. for residential emoluments. The appointment will be for 1 year.

Applications, stating age, nationality, qualifications, and experience, together with copies of not more than 3 testimonials, to be submitted immediately to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

**NORTH WEST METROPOLITAN REGIONAL HOS-**PITAL BOARD. Whole-time REGISTRAR in Dermatology, based on West Middlesex Hospital, Isleworth (1142 Beds). Duties will include also clinics at hospitals in the Uxbridge, Staines, and Windsor Groups. Appointment for 1 year in first instance. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, South West Middlesex Group Hospital Management Committee, West Middlesex Hospital, Isleworth, by 1st November, 1955.

**OXFORD. WINGFIELD-MORRIS ORTHOPÆDIC HOS-**PITAL. Applications are invited from suitably qualified persons for a SENIOR HOUSE OFFICER grade appointment from 1st January, 1956.

Applications, with names of referees, to be submitted to the Secretary within 14 days of this advertisement.

**PLYMOUTH. SOUTH DEVON AND EAST CORNWALL** HOSPITAL.

HOUSE SURGEON (pre-registration post), vacant 1st December, 1955. Devonport Section.

HOUSE PHYSICIANS (pre-registration posts), 2 vacancies 1st January, 1956. Freedom Fields Section.

HOUSE SURGEONS (pre-registration posts), 2 vacancies 1st January, 1956. Recognised for the F.R.C.S. Freedom Fields Section.

PÆDIATRIC HOUSE PHYSICIAN, vacant 1st January, 1956. Recognised for the D.C.H. Freedom Fields Section.

HOUSE SURGEONS (pre-registration posts), vacancies 12th December, 1955, 1st and 11th January, 1956. Recognised for the F.R.C.S. Greenbank Road Section.

HOUSE PHYSICIANS (pre-registration posts), 2 vacancies 1st January, 1956. Greenbank Road Section.

Applications, stating age, nationality, qualifications, and experience, with names of 3 referees, to be sent to—

ARTHUR R. CASH, Group Secretary, Plymouth,
South Devon and East Cornwall General Hospital Group.
7, Nelson-gardens, Stoke, Plymouth.

**POOLE GENERAL HOSPITAL, Longfleet-road, Poole.** BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Locum RESIDENT SURGICAL OFFICER (Registrar status) required immediately.

Applications to the Hospital Secretary.

**POOLE GENERAL HOSPITAL, Poole, Dorset. Bourne-**MOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. 2 HOUSE SURGEONS (pre-registration) required. 1 post vacant 12th November, 1955, and the second 3rd December, 1955. The Hospital is recognised for the F.R.C.S. and F.R.C.S.E.

Applications to the Hospital Secretary.

**PORTSMOUTH GROUP HOSPITAL MANAGEMENT** COMMITTEE.

**Royal Portsmouth Hospital** (104 orthopædic and 70 surgical beds)

HOUSE OFFICER (orthopædic), vacant now.

**St. Mary's Hospital** (130 surgical beds)

HOUSE SURGEON (pre-registration), vacant 1st November, 1955.

Applications, stating age, experience and qualifications, together with names of 2 referees, should be forwarded as soon as possible to L. C. ROGERS.

35, Grove-road South, Southsea.

**PORTSMOUTH GROUP HOSPITAL MANAGEMENT** COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment, vacant 1st January, 1956, of REGISTRAR in the Chest Services of the Group for duties at the Portsmouth Chest Clinic and the tuberculosis wards at the Infectious Diseases Hospital and Saint Mary's Hospital, Portsmouth, including experience with a major Thoracic Surgery Unit.

Forms of application may be obtained from the Acting Group Secretary, Portsmouth Group Hospital Management Committee, 35, Grove-road South, Southsea, which should be returned to him duly completed on or before 31st October, 1955. Candidates may visit the above Clinic and Hospital by arrangement with the Acting Group Secretary.

**REDHILL. EAST SURREY HOSPITAL, Shrewsbury-**road, REDHILL, SURREY. (139 Beds.) SENIOR HOUSE OFFICER (surgical), Male, required immediately.

Apply to the Hospital Secretary.

**ROMFORD. VICTORIA HOSPITAL. (99 Beds.)** Temporary SURGICAL REGISTRAR (Male) required from 11th November, 1955.

Applications should be forwarded to Secretary, Romford Group Hospital Management Committee, at Oldchurch Hospital, Romford, as early as possible.

**ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (301** Beds.) SENIOR HOUSE OFFICER (Male or Female) required from 9th November, 1955, to work for the time being in the Regional Poliomyelitis Unit (30 Beds) and subsequently in general medical duties. Resident post.

Applications to Medical Superintendent.

**ROMFORD, ESSEX. RUSH GREEN HOSPITAL.** REGISTRAR required for the Regional Poliomyelitis Unit (30 Beds), the vacancy being for a minimum period of 3 months commencing mid-November. The post affords excellent opportunity for the study and care of respiratory and bulbo spinal poliomyelitis with different types of modern apparatus.

Applications as soon as possible to the Medical Superintendent.

**ROCHDALE AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE.** HOUSE OFFICER (surgery) post vacant at Rochdale Infirmary early December. Pre-registration candidates eligible for this post which is recognised for 6 months. F.R.C.S. experience.

Apply at once to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale.

**SALISBURY GENERAL HOSPITAL. Applications are** invited for the appointment of RESIDENT HOUSE SURGEON/HOUSE PHYSICIAN to run consecutively in this order from 1st January, 1956, for a period of 6 months in each post. The post is open to pre-registration candidates.

Apply, naming 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

**SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD.** General Surgery. **MARYFIELD HOSPITAL, DUNDEE.** Applications are invited for the post of SENIOR REGISTRAR in General Surgery at Maryfield Hospital, Dundee, a general teaching hospital of 380 Beds. The post is an active teaching unit associated with the Medical School of the University of St. Andrews. A higher qualification and previous experience in general surgery are essential. Salary and conditions of service in accordance with national agreement.

Further particulars and forms of application from the Secretary to the Board, "Bracknowe," 430, Blackness-road, Dundee, with whom applications must be lodged not later than 5th November, 1955.

**SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD.** Applications are invited for the appointment of a SENIOR REGISTRAR in the Regional Pool of Anæsthetists, based on the Royal Infirmary of Edinburgh, vacant on 8th January, 1956.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 3 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 12th November, 1955.

**SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD.** Applications are invited for the appointment of REGISTRAR in the Regional Pool of Anæsthetists, based on the Royal Infirmary of Edinburgh. The post is vacant on 1st January, 1956, and the successful applicant will be seconded for periods of duty in peripheral hospitals.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 2 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, by 12th November, 1955.

**SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD.** Applications are invited for the appointment of REGISTRAR in Surgery to the Edinburgh Southern Group of hospitals, his or her main duties being in the Bruntsfield and Longmore Hospitals.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 2 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, by 12th November, 1955.

**SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD.** Applications are invited for an appointment as SENIOR HOUSE OFFICER for duties in Obstetrics and Gynæcology at Robroyston Hospital and Victoria Infirmary, Glasgow (joint appointment), which will be for 1 year in the first instance, and will be subject to National Health Service (Scotland) superannuation regulations.

Applications, stating age, qualifications, and present appointment, and giving names of 3 referees, should be submitted forthwith to the Secretary, Board of Management for Glasgow Victoria Hospitals, 24, St. Vincent-place, Glasgow.

**SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD.** Applications are invited for the post of SENIOR HOUSE OFFICER in Obstetrics at Robroyston Hospital, Glasgow. The appointment will be for 1 year ir the first instance.

Applications, stating age, qualifications, experience, and present appointment, and naming 3 referees, to be lodged with the Secretary, Board of Management for Glasgow Northern Hospitals, 13, Woodside-place, Glasgow, C.3, by 31st October, 1955.

**SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD.** Applications are invited for the post of SENIOR HOUSE OFFICER in Obstetrics and Gynæcology at Western District Hospital, Glasgow. The appointment will be for 1 year in the first instance.

Applications, stating age, qualifications, experience, and present appointment, and naming 3 referees, to be lodged with the Secretary, Board of Management for Glasgow Northern Hospitals, 13, Woodside-place, Glasgow, C.3, by 31st October, 1955.

**SCUNTHORPE. WAR MEMORIAL HOSPITAL. (267** Beds.) Vacancy for HOUSE SURGEON (Senior House Officer) end of November. Post offers excellent experience.

Applications, naming 2 referees, to Group Secretary, Scunthorpe Hospital Management Committee.

**SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL.** **WINDSOR GROUP HOSPITAL MANAGEMENT COMMITTEE.** Locum HOUSE PHYSICIAN required 24th October–6th November inclusive.

Applications, together with names of 2 referees, to Hospital Secretary.

**SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL.** **WINDSOR GROUP HOSPITAL MANAGEMENT COMMITTEE.** HOUSE OFFICER (casualty) required, 1 of 2, for busy Casualty Department. Experience provided in orthopædic and plastic cases.

Applications, stating age and qualifications together with copies of 2 testimonials, to Hospital Secretary.

**SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-**time SENIOR REGISTRAR in Psychiatry required for the Pastures Hospital, Mickleover, near Derby. D.P.M. essential. House available. Appointment for 1 year in the first instance, reviewable annually. Opportunity for research and experience in those special branches of psychiatry available in the Hospital area.

Application forms and details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 7th November, 1955.

**SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS.** **CHILDREN'S HOSPITAL UNIT.** Applications are invited for the post of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade). Post vacant 3rd January, 1956. The post is suitable for persons training for pædiatrics or contemplating a career in pathology. The holder is expected to attend clinical rounds and meetings and to assist in the investigation of clinical problems.

Applications, stating age, qualifications, and experience, with the names of 2 referees (or enclosing copy testimonials), should be sent immediately to the Superintendent, Children's Hospital, Western Bank, Sheffield, 10.

**SMETHWICK. MIDLAND CENTRE FOR NEUROSURGERY, HOLLY-LANE, SMETHWICK, 41.** RESIDENT SENIOR HOUSE OFFICER, vacant 1st December, 1955. This is a new hospital entirely devoted to neurology and neurosurgery, within easy reach of Birmingham. Salary on national scale, less deduction for board, lodging, &c.

Applications, with names of 2 referees, to the Group Secretary, West Bromwich and District Hospitals Management Committee.

**SOUTHAMPTON GENERAL HOSPITAL. (Recognised** for the Membership and Diploma examinations of the R.C.O.G.) 2 HOUSE SURGEONS (resident) required end of November and mid-December, 1955, for Gynæcological and Obstetric Unit. Posts tenable 6 months, 1 being recognised for Pre-registration Service.

Applications, with copies of recent testimonials, should be forwarded as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

**SOUTHAMPTON GENERAL HOSPITAL. (471 Beds—** 87 surgical.) 2 HOUSE SURGEONS required end of November and mid-December, 1955. Posts tenable for 6 months. Both recognised for F.R.C.S. and Pre-registration Service.

Applications, with copies of testimonials, should be forwarded as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

**SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL.** (278 Beds. Recognised for F.R.C.S.) RESIDENT HOUSE SURGEON required mid-October. Pre-registration candidates eligible.

Applications, with copies of testimonials, should be forwarded to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

**SOUTHPORT PROMENADE HOSPITAL. Senior House** OFFICER (Physician). This resident post vacant 16th November.

Apply, stating age, qualifications, experience and nationality with 2 copy testimonials, to Group Secretary, Southport and District Hospital Management Committee, Promenade Hospital, Southport.

**STOKE-ON-TRENT. CITY GENERAL HOSPITAL.** (845 Beds.) Whole-time SENIOR REGISTRAR (resident/non-resident) in Anæsthetics. Successful candidate may subsequently be required to spend not more than 2 years in a selected hospital of the United Birmingham Hospitals in accordance with arrangements for interchange of Senior Registrars agreed by the 2 Boards.

Application forms from Secretary, Regional Hospital Board, 10, Augustus-road, Birmingham, 15, to be returned before 7th November, 1955.

**STOKE-ON-TRENT. CITY GENERAL HOSPITAL.** HOUSE OFFICER (general surgery) required. Recognised F.R.C.S. and pre-registration.

Applications to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

**STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY.** HOUSE OFFICER (general surgery), vacant shortly. Recognised F.R.C.S. and pre-registration.

Applications to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

**STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY.** SENIOR HOUSE OFFICER (anæsthetics) required. Recognised D.A. Recognition F.F.A.R.C.S. applied for. Previous anæsthetic experience desirable but not essential.

Detailed applications to Hospital Management Committee Secretary, Princes-road, Stoke-on-Trent.

**STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY.** (455 Beds.) SENIOR HOUSE OFFICER (E.N.T.) required, vacant now. Recognised F.R.C.S.

Applications to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent, as soon as possible.

**TAUNTON AND SOMERSET HOSPITAL. Applications** are invited for the post of HOUSE OFFICER (E.N.T.), vacant now. Pre-registration appointment.

Applications, stating age, nationality, and qualifications, together with the names of 2 referees, should be forwarded immediately to the Group Secretary, Taunton Hospital Management Committee, Taunton and Somerset Hospital, Musgrove Park Branch.

**TUNBRIDGE WELLS (near). PEMBURY HOSPITAL,** PEMBURY. TUNBRIDGE WELLS GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications invited from suitably qualified practitioners for post of RESIDENT OBSTETRICIAN AND HOUSE SURGEON to Gynæcological Unit (Senior House Officer) to begin duties on 1st December, 1955. Appointment for 12 months and recognised as combined post for M.R.C.O.G. Candidates should have had previous experience and post is intended for those working for the higher examination.

Apply as soon as possible to Group Secretary, Sherwood Park, Pembury-road, Tunbridge Wells.

**VENTNOR, I.W. ROYAL NATIONAL HOSPITAL FOR** DISEASES OF THE CHEST. (249 Beds.) Required, JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER (resident post). Hospital has all facilities for major thoracic surgery.

Applications, with names of 2 referees, to Physician-Superintendent.

**WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL.** Applications invited for position of SENIOR HOUSE OFFICER in the following Regional Units, (i) Thoracic Surgery Department, (ii) Neurological Department. Salary £745 p.a. A charge of £155 p.a. is made for accommodation.

Address written applications, giving full personal particulars and details of experience, &c., together with 2 names and addresses for reference, to—

W. BOWRING, Group Secretary.
Victoria Chambers, Wood-street, Wakefield.

**WAKEFIELD. CLAYTON HOSPITAL. (200 Beds.)** HOUSE SURGEON (general surgery and orthopædics) required at the above Hospital. This is a pre-registration post recognised for F.R.C.S. and is vacant on 1st November, 1955. Salary and conditions of service in accordance with national recommendations.

Applications to the Group Secretary, Hospital Management Committee No. 9 Wakefield A Group, 113, Northgate, Wakefield.

**WAKEFIELD. GENERAL HOSPITAL, Park Lodge-lane,** WAKEFIELD. (158 Beds.) HOUSE PHYSICIAN (general medicine and paediatrics) required at the above Hospital. This is a pre-registration post and is vacant on 1st November, 1955. Salary and conditions of service in accordance with National recommendations.

Applications to the Group Secretary, Hospital Management Committee No. 9 Wakefield A Group, 113, Northgate, Wakefield.

**WARRINGTON INFIRMARY. (172 Beds.) Applications** are invited from persons experienced in anæsthetics for the post of RESIDENT ANÆSTHETIST (Male or Female), graded as Senior House Officer. The Hospital is recognised for the D.A. examination. Salary £745 p.a., less a deduction of £195 p.a. for residential emoluments.

Applications, stating qualifications and experience, should be sent to—

H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancs.

**WARRINGTON INFIRMARY. (172 Beds.) Applications** are invited for a vacancy at the above Hospital for a RESIDENT HOUSE SURGEON (Male or Female). Recognised for pre-registration. Salary will be £425–£525 p.a., less a deduction of £125 for full residential emoluments.

Applications should be sent to—

H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancashire.

**WARRINGTON INFIRMARY. (172 Beds.) Applications** are invited for the post of RESIDENT CASUALTY OFFICER (Male or Female). The post is graded Junior Hospital Medical Officer. Scale of salary £775–£50–£1075, less a deduction of £130 for residential emoluments. Applications will also be considered from Junior Medical Officers who would be graded House Officer or Senior House Officer at the scale appropriate to the experience of the applicant. Consideration will also be given to applicants who desire the appointment on a short-term basis. A whole-time Senior Hospital Medical Officer is in charge of the department.

Applications, stating age, experience, and qualifications, should be forwarded or telephoned to—

H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancs.
(Tel. No. Warrington 1666.)

**WARWICK (near). CENTRAL MENTAL HOSPITAL.** (1400 Beds.) SENIOR HOUSE OFFICER required. Neurosis unit, adult and child psychiatry clinics, Departments of Electro-encephalography, Occupational Therapy, Psychology and Social Work. Recognised for D.P.M. Married or single quarters. Salary £745 p.a.

Applications, with names and addresses of 3 referees, to Medical Superintendent within 14 days of appearance of this advertisement.

**WOODFORD GREEN, ESSEX. JUBILEE HOSPITAL.** ANÆSTHETIST required for 2 sessions per week. Salary £175 p.a. for each weekly notional half-day. Candidates should be prepared to undertake a proportion of emergency work. Preference will be given to candidates holding the Diploma of Anæsthetics.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Hospital Management Committee Forest Group, Langthorne-road, E.11.

**WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-**PITAL. (315 Beds.) SENIOR HOUSE OFFICER (orthopædics) required. Post recognised F.R.C.S. Wide experience available under Area Orthopædic team. Appointment for 6 months in first instance. Vacant immediately.

Applications, with copies of 2 testimonials, to the Secretary.

**WELSH REGIONAL HOSPITAL BOARD.**

REGISTRAR in Ophthalmology to serve Glantawe Hospital Management Committee. Based at Llanelly Hospital (24 ophthalmic beds), expected to serve other hospitals in Group. Non-resident.

REGISTRAR in Infectious Diseases. Based City Isolation Hospital, Cardiff (219 Beds). To serve Cardiff Hospital Management Committee. Resident/non-resident.

Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

**WIGAN AND LEIGH HOSPITAL MANAGEMENT** COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics), resident, for duties at Wigan Infirmary, Billinge Hospital, and other hospitals in the Group. Post recognised for F.F.A.R.C.S. examinations. Facilities for experience in major thoracic and orthopædic work.

Applications to Secretary, Wigan and Leigh Hospital Management Committee, Knowsley House, Wigan.

**WIGAN. ROYAL ALBERT EDWARD INFIRMARY.** SENIOR RESIDENT CASUALTY OFFICER (Male or Female) required. Junior Hospital Medical Officer grade. The Casualty Department offers exceptional opportunities for the treatment and disposal of a large number of cases of wide variety and interest and is closely associated with the Orthopædic Department. The successful applicant will work under the supervision of the Consultant Orthopædic Surgeons.

Applications, with full details and the names of 2 referees, should be forwarded to the Secretary, Royal Albert Edward Infirmary, Wigan, as soon as possible.

**WINDSOR. KING EDWARD VII HOSPITAL. Obstetric** AND GYNÆCOLOGICAL HOUSE SURGEON (Male or Female) required for post vacant 1st December. Post recognised for both M.R.C.O.G. and D.Obst.R.C.O.G. Not a pre-registration post. Successful candidate will be resident at the Old Windsor Unit of the Hospital. Applicants required to be members of a Medical Protection Society.

Applications, stating age, nationality, qualifications with dates, with copies of tecent testimonials or names of 3 referees, to Hospital Secretary by 29th October.

**WOLVERHAMPTON GROUP.**

**The Royal Hospital** (an Associated Hospital of the University of Birmingham Medical School)
SENIOR HOUSE OFFICER or HOUSE OFFICER (Fracture and Orthopædic Department), vacant now.

**New Cross Hospital**
HOUSE OFFICER (general surgery), vacant now.
HOUSE OFFICER (general medicine), vacant now.
Pre-registration posts.

Apply Group Secretary, Royal Hospital, with copies of testimonials.

**WOLVERHAMPTON GROUP.**

**The Royal Hospital**
JUNIOR PATHOLOGIST required. Salary in Junior Hospital Medical Officer grade. Comprehensive service offering wide experience and training. Resident post vacant 1st January, 1956. Candidates may visit Pathologist.

Applications by 7th November to Group Secretary, The Royal Hospital, Wolverhampton.

**WORCESTER. RONKSWOOD HOSPITAL. (300 Beds.)** Applications invited for post of HOUSE SURGEON (Senior House Officer) in General Surgery.

Applications, with copies of testimonials, to the Hospital Secretary.

**WORTHING HOSPITAL, Lyndhurst-road, Worthing.** (210 Beds—General.) The vacancy of HOUSE SURGEON will occur in mid-November, 1955.

Applications from either registered medical practitioners, or pre-registration candidates, stating age, qualifications, experience, nationality, and enclosing copies of 2 recent testimonials, to be forwarded to the Hospital Secretary as soon as possible.

A. V. OAKTON, Group Secretary,
Worthing Group Hospital Management Committee.

**WREXHAM WAR MEMORIAL HOSPITAL. (230 Beds.)** WREXHAM, POWYS AND MAWDDACH HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (resident or non-resident) for the Casualty Orthopædic Department of the above Hospital. The appointment is recognised for the Diploma of F.R.C.S. (Eng. and Edin.) and is subject to a limited tenure of 2 years, which may be reviewed at the end of that period. Salary £775–£50–£1075 p.a., Whitley Council conditions of service.

Applications, giving details of age, qualifications, and previous experience, together with copies of 2 recent testimonials, should be sent to WILLIAM JONES, Secretary, Wrexham, Powys and Mawddach Hospital Management Committee, Maelor General Hospital, Wrexham, as soon as possible.

**CORK SANATORIA BOARD. Applications are invited** for the office of JUNIOR MEDICAL OFFICER at Heatherside Sanatorium, Buttevant, co. Cork. The office is whole-time temporary, and non-pensionable. Remuneration will be at the rate of £650 p.a., plus temporary bonus at the rate of 8½ per cent., subject to a deduction of £150 in respect of emoluments (viz., rations, apartments, attendance, fuel, light, and laundry) provided.

Completed forms should be lodged not later than 5 P.M. on Friday, 4th November, 1955, with the undersigned from whom application forms and further particulars may be obtained.

D. O'DONOVAN, Secretary.
Monument Buildings, 42, Grand-parade, Cork.

**NORTHERN IRELAND. ROE VALLEY HOSPITAL,** LIMAVADY, CO. LONDONDERRY, N.I. 2 House Officers required immediately at above Hospital: (*a*) RESIDENT SENIOR HOUSE OFFICER (medicine/obstetrics); (*b*) RESIDENT HOUSE OFFICER (pre-registration—surgical).

Applications to the Secretary as soon as possible.

**NEW YORK. ALBANY HOSPITAL, Albany, New York, U.S.A.** PSYCHIATRY RESIDENCIES available in 600-Bed University Teaching, General Hospital with 60-Bed acute treatment Psychiatric Unit fully approved for 3 years training. Experience includes dynamically-oriented psychotherapy with children and adults, shock therapies and neurologic training. Salary range $1920–$4000 annually, plus laundry, uniforms, and room.

Address inquiries to Medical Director.

**NEW YORK. ALBANY HOSPITAL, Albany, New York, U.S.A.** INTERNSHIPS and RESIDENCIES available in 600-Bed general, private Albany Hospital, directly connected with Albany Medical College. Approved for all major specialties. Participating in Exchange-Visitor Programme. Salary range $1620–$2520 annually in addition to laundry, uniforms and room. All appointments begin 1st July, 1956.

For further information apply to Medical Director.

## Public Appointments

**DUBLIN BOARD OF ASSISTANCE.** Applications are invited from suitably qualified persons for appointment as RESIDENT SURGICAL REGISTRAR at St. Kevin's Hospital, Dublin. The appointment will be for a period of 1 year but may be extended at yearly intervals for a further period not exceeding 2 years. Salary £800 a year inclusive, subject to a deduction of £150 a year for residential emoluments.

Application forms and full particulars may be obtained from the Establishment Department. The latest date for the receipt of completed applications for appointment will be 28th October, 1955. SEAMUS O. MURCHADHA Chief Executive Officer.

1, James's-street, Dublin, 10th October, 1955.

**DURHAM. COUNTY COUNCIL OF DURHAM.** Applications are invited from registered medical practitioners (Men and Women) for appointment as SCHOOL MEDICAL OFFICER. Applicants must be under 55 years of age and have had at least 3 years experience in the practice of their profession. Salary scale £975–£50–£1375 p.a.

Conditions of appointment and forms of application may be obtained from the undersigned, to whom completed application forms must be returned not later than 7th November, 1955.

G. H. METCALFE, Director of Education.

Shire Hall, Durham, 4th October, 1955.

**EASTBOURNE. COUNTY BOROUGH OF EASTBOURNE.** HEALTH AND WELFARE SERVICES DEPARTMENT. DEPUTY MEDICAL OFFICER OF HEALTH AND DEPUTY PRINCIPAL SCHOOL MEDICAL OFFICER. Applications are invited for the above appointment from registered medical practitioners possessing the Diploma in Public Health or similar qualification. Duties are administrative and clinical. Housing accommodation at an appropriate rental suitable to the needs of the applicant may be made available to the successful candidate if required. Salary in accordance with the scale of £1220–£52 10s.–£1430 a year. A car allowance is provided.

Further particulars and form of application, returnable by 29th October, 1955, from K. O. A. VICKERY, Medical Officer of Health.

Avenue House, The Avenue, Eastbourne.

**FACTORY DOCTORS. Factories Acts, 1937 and 1948.** The following appointments as Appointed Factory Doctor are vacant. Apply to Chief Inspector of Factories, 19, St. James's square, London, S.W.1.

| *District* | *County* | *Latest date for receipt of applications* |
|---|---|---|
| SHIPLEY | YORK | 5TH NOVEMBER, 1955 |
| NOTTINGHAM WEST | NOTTINGHAM | 5TH NOVEMBER, 1955 |
| BRADFORD EAST | YORK | 5TH NOVEMBER, 1955 |
| MIDDLETON | LANCASTER | 5TH NOVEMBER, 1955 |

**WALTHAMSTOW BOROUGH COUNCIL. Essex County** COUNCIL. DEPUTY MEDICAL OFFICER OF HEALTH AND ASSISTANT COUNTY MEDICAL OFFICER OF HEALTH. Applications are invited from duly qualified and experienced medical practitioners possessing the Diploma in Public Health, or similar qualification, for the above-mentioned posts which together constitute 1 whole-time appointment. Preference will be given to applicants approved by the Ministry of Education as Certifying Officers. The officer appointed will be required to devote one-third of whole-time to duties for the Borough Council and two-thirds to duties for the County Council.

Remuneration (in accordance with appropriate Industrial Court Awards) as follows :—

Borough Council : £487 8s. 2d.–£17 3s. 4d. (5)–£573 4s. 10d.

County Council : £731 5s. 0d.–£37 10s. 0d. (8)–£1031 5s. 0d.

The appointment is subject to medical examination, and in the case of the Borough Council appointment, to the consent of the Minister of Health. Whitley Medical Council conditions of service will apply and also the relevant Standing Orders of the 2 employing authorities. The appointments are superannuable.

Application forms are obtainable from, and returnable to, the Medical Officer of Health, Town Hall, Walthamstow, as early as possible. Canvassing directly or indirectly will disqualify.

G. A. BLAKELEY, Town Clerk.

Town Hall, Walthamstow, E.17, 14th October, 1955.

**GOVERNMENT OF BAHRAIN. British Medical Officer** (Female). Government of Bahrain Medical Department invites applications from British Women Doctors for the post of MEDICAL OFFICER to the Women's Hospital for general duties in Hospital, Outpatients and Village Dispensaries. Age 28–40. Minimum salary at age 28, £1539, rising £45 annually. No allowances. Non-contributory gratuity on retirement, or pension scheme. Private practice among Europeans only. No income-tax. Free quarters with hard furniture and car. Agreement for 2 years, renewable, with 5 months home leave on full pay and free air passages.

Applications, with 3 testimonials and photograph, should be sent to the Chief Medical Officer, Bahrain Government Hospital, Bahrain, Persian Gulf.

**GOVERNMENT OF BAHRAIN. British Surgeon** (Female). Government of Bahrain Medical Department invites applications from British Women Doctors, F.R.C.S. or M.R.C.O.G., for the post of SURGEON to the Women's Hospital. Age 28–40. Minimum salary at age 28, £2157, rising £45 annually. No allowances. Non-contributory gratuity on retirement, or pension scheme. Private practice among Europeans only. No income-tax. Free quarters with hard furniture and car. Agreement for 2 years, renewable with 5 months home leave on full pay and free air passages.

Applications, with 3 testimonials and photograph, should be sent to the Chief Medical Officer, Bahrain Government Hospital, Bahrain, Persian Gulf.

**GOVERNMENT OF TRINIDAD. Medical Officer Grade** "A" (Physician) required in the Health Department of Trinidad to take charge of wards, medical clinics, examinations of Civil Servants, Medical Boards, reports on medical subjects and such other duties as the Director of Medical Services may assign from time to time. Candidate must possess qualifications registrable in the United Kingdom, be a Member of 1 of the Royal Colleges of Physicians and have had at least 5 years post-graduate experience. Appointment will be on agreement for 3 years in the first instance. Candidates in the National Health Service may resign from the National Health Service but retain their superannuation rights during their time abroad (up to 6 years) and receive a gratuity (taxable) of 20% of the aggregate of their salary after their engagements. Salary scale ranges from $B.W.I.7200 to $B.W.I.7680 (£1500–£1600) a year (1 B.W.I. $ = 4s. 2d.). Consulting practice is not permitted, but an allowance at the rate of $960 (£200) a year is payable in lieu. Quarters are not provided, but an allowance in lieu is payable to an Officer recruited from outside the Colony. Free return passages are provided for Officer, wife and children not exceeding 5 persons in all. Children to be under 18 years of age, unmarried and dependent upon officer. Income-tax at local rates. Local leave is permissible and generous home leave is granted after tour. Education facilities are available.

Application forms from the Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. BCD.117/38/09).

**HER MAJESTY'S OVERSEA CIVIL SERVICE. Trinidad.** MEDICAL OFFICER required primarily for duty in the Mental Hospital. Appointment can be made on a permanent basis with pension (non-contributory) at the age of 60, or on short-term agreement. A candidate in the National Health Service may resign from the National Health Service but retain his superannuation rights during his time in Trinidad (up to 6 years) and receive a gratuity (taxable) of 20% of the aggregate of his salary at the end of his engagement. Salary scale ranges from $B.W.I.6720 to $B.W.I.7200 (£1400–£1500) p.a. Pension is earned at the rate of 1/600th of the final pensionable emoluments for each completed month of service. Quarters are not provided, but an allowance in lieu is payable to an Officer recruited from outside the Colony. Free passages on first appointment are provided for Officer and family not exceeding 5 persons in all, also free passages on leave subject to a maximum of 3 adult fares. Income-tax at local rates. Local leave is permissible and generous home leave is granted after each tour. Educational facilities are available. Candidates must possess qualifications registrable in the United Kingdom. They should also possess the Diploma in Psychological Medicine and have had at least 3 years post-graduate experience in the practice of psychological medicine, 2 of which should have been spent working in a mental hospital.

Application forms can be obtained from the Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. BCD.117/38/05).

**HER MAJESTY'S OVERSEA CIVIL SERVICE. Medical** BRANCH—UGANDA. MEDICAL OFFICER required for general medical duties and to assist with training subordinate African medical staff. Appointment can be made (subject to 2 years probation) on a permanent basis with pension (non-contributory) at the age of 45–55, or on short-term contract with gratuity. Salary scale ranges from £1116 to £1836 a year, plus a temporary (non-pensionable) cost-of-living allowance of 10% of salary subject to a maximum of £162 a year. Commencing salary is determined according to qualifications and experience. Pension is earned at the rate of 1/600th of final pensionable emoluments for each completed month of service. The gratuity (taxable) in respect of contract service is 13½% of total salary drawn, not including allowances. Candidates in the National Health Service may resign from the National Health Service but retain their superannuation rights up to 6 years and receive a gratuity (taxable) of 20% of the aggregate of their salary after the end of their engagements. Permanent Medical Officers are eligible to be considered at any time for promotion to super-scale posts in Uganda and other territories in medical administration or, if they possess appropriate qualifications and suitable experience, in specialist posts. Quarters are provided at rental between £21 and £60 a year ; items of hard furniture supplied at rental of £12–£24 a year. Free passages provided in both directions : for officers serving tour of 30–36 months, 4 tourist class air passages provided for officer, wife and dependent children or sea passages (first class) up to cost of 3 adult fares ; for officers serving short tours of 12–18 months, tourist passages provided for Officer, wife, and all dependent children. Educational subsidies are payable to officers, which vary from £90 a year (or half the school fees, whichever is less) for the primary education for the first child to £140 a year (or three-fifths of school fees, whichever is less) for secondary education with additional £9 for second child and £18 for third or subsequent children attending school at same time. Education facilities are available in East Africa, though many parents send their children home to United Kingdom for secondary education. Income-tax at local rates. Local leave is permissible and generous home leave is granted after each tour. Candidates must possess medical qualifications registrable in the United Kingdom.

Application forms from Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. BCD.117/9/02).

**HER MAJESTY'S OVERSEA CIVIL SERVICE. Medical** BRANCH—TRINIDAD. RADIOLOGIST required for service in the Health Department, Trinidad, to carry out radiological diagnosis, X-ray, and other treatments and perform other specialised duties as may be required. Appointment can be made on permanent basis with pension (non-contributory) at the age of 60, or on short-term contract with gratuity (taxable) of £37 10s. for each period of 3 months of service (including leave). Pension is earned at the rate of 1/600th of the final pensionable emoluments for each completed month of service. Salary is in scale $B.W.I.8160–$B.W.I.8640 (£1700–£1800) a year, which includes $960 (£200) non-pensionable allowance in lieu of private and consulting practice. Candidates in the National Health Service may resign from the National Health Service but retain their superannuation rights up to 6 years and receive gratuities (taxable) of 20% of the aggregate of their salaries. Quarters are not provided; but an allowance in lieu is payable to an Officer recruited from outside the Colony. Free passages on first appointment are provided for Officer and family, not exceeding 5 persons in all, and free passages on leave subject to a maximum of 3 adult fares. Income-tax at local rates. Tour of service is 3 years. Local leave is permissible and generous home leave is granted after each tour. Education facilities are available. Candidates must possess medical qualifications registrable in the United Kingdom and a Diploma in Medical Radiology, or equivalent recognised qualification, and should have had suitable experience in a recognised hospital in radiodiagnosis and radiotherapy.

Application forms from the Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. BCD.117/38/010).

**BIRMINGHAM. CITY OF BIRMINGHAM EDUCATION** COMMITTEE. Applications are invited from registered medical practitioners (Men or Women) for appointment as SCHOOL MEDICAL OFFICER in the School Health Service. The possession of a D.P.H. or D.C.H. will be an advantage. Salary in accordance with Whitley Council scale of £975–£50–£1375 p.a. Appointment is subject to the appropriate superannuation act and to the passing of a medical examination.

Forms of application obtainable from the undersigned (stamped addressed envelope) must be returned not later than 21st November, 1955. Canvassing disqualifies.

E. L. RUSSELL, Chief Education Officer.

Queen's College Chambers, 38A, Paradise-street, Birmingham, 1.

**GAMBIA MEDICAL DEPARTMENT. Medical Officers** possessing qualifications registrable in the United Kingdom are required for the following posts in the Gambia:—

(1) MEDICAL OFFICER (Leprosy) to be in charge of a leprosy project sponsored by the World Health Organisation/United Nations International Children's Emergency Fund, for the control and treatment of leprosy, and to supervise leprosy treatment centres. Experience in leprosy is not essential but would be an advantage. The officer selected will be offered a World Health Organisation travelling fellowship soon after appointment.

(2) MEDICAL OFFICER OF HEALTH whose duties will consist of general public health work and such other special medical duties as the Director of Medical Services may direct. Candidates must hold the Diploma in Public Health.

Appointment to the post of Medical Officer (Leprosy) may be as follows:—

(*a*) On short-term contract (2 tours each of 18–24 months duration) with inclusive salary of from £1098 rising to £2004 a year; after completion of contract a gratuity (taxable) is paid at the rate of £37 10s. for each completed period of 3 months (including leave).

(*b*) From the National Health Service. Candidates may leave the National Health Service but retain their superannuation rights up to 6 years and receive a gratuity (taxable) of 20% of the aggregate of their salary. Inclusive salary of candidates so appointed is in the scale £942–£1860 a year.

Appointment to the post of Medical Officer of Health may be as (*a*) or (*b*) above, or

(*c*) On 3 years probation for permanent and pensionable employment with retiring age of between 45 and 55. Pensions (which are non-contributing) are at the rate of 1/600th of the final pensionable emoluments for each completed month of reckonable service. Inclusive salary is in the scale £942–£1860 a year.

Starting salary in both cases depends upon qualifications and experience. Quarters provided at low rental. Free passages in both directions for Officer, wife, and up to 2 children under 18 years of age. Income-tax at low local rates. Local leave is permissible and generous home leave is granted after each tour.

Application forms from Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. BCD.117/12/07).

**NORTHUMBERLAND COUNTY COUNCIL. Applications** are invited from registered medical practitioners for the appointment of ASSISTANT COUNTY MEDICAL OFFICER to undertake duties primarily connected with maternal and child welfare. Salary will be in accordance with the scale of £975, rising by annual increments of £50 to £1375 p.a. Previous experience may be taken into consideration in determining the commencing salary. Travelling and subsistence allowances when applicable will be paid in accordance with the Council's scale. The appointment is subject to superannuation and will be determinable by 3 months notice on either side. The successful candidate will be required to pass a medical examination.

Forms of application and any further particulars required may be obtained from the undersigned and must be returned not later than 5th November, 1955.

JOHN B. TILLEY, County Medical Officer.

County Hall, Newcastle upon Tyne, 1.

**MAURITIUS. Specialist Anæsthetist required in the** Medical Department, Mauritius, to administer anæsthetics in hospitals under the direction of the Director of Medical Services. Candidates must have qualifications registrable by the General Medical Council in the United Kingdom, with experience in anæsthesia. Possession of the F.F.A.R.C.S. or D.A. would be an advantage. Appointments can be made on a permanent basis with pension (non-contributory) at the age of 55, or on short-term contract with gratuity (taxable). Starting salary is Rs.14,220 a year in the scale Rs.14,220–Rs.20,820 (£1066 10s.–£1561 10s.) a year. In addition a temporary non-pensionable cost-of-living allowance is payable at the rate of 8% of salary. The gratuity payable after satisfactory completion of contract appointment is at the rate of £50 for each completed period of 3 months service. Officers are not entitled to quarters. There are a few Government-owned houses and officers who have not been allocated one will be reimbursed any difference between the approved rent paid for a furnished private house (subject to a maximum of Rs.300 (£22 10s.) a month), and the 10% of salary that they would normally pay for a Government house. Officers residing in hotels or boarding houses will be regarded as paying rent for the first 21 days at one half and thereafter one quarter of the board and lodging charges for themselves and their wives. Income-tax is payable at local rates. Free passages in both directions are provided for Officer, wife and children not exceeding 5 persons in all. Generous home leave is normally granted after each tour of 3 or 4 years.

Application forms from the Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. BCD.117/52/09).

**SOUTHPORT. COUNTY BOROUGH OF SOUTHPORT.** Applications are invited from registered medical practitioners for the appointment of DEPUTY MEDICAL OFFICER OF HEALTH AND DEPUTY SCHOOL MEDICAL OFFICER. Applicants should possess a Diploma in Sanitary Science, Public Health or State Medicine and should have had experience in a health department. Salary scale £1187 15s. 7d.–£51 10s. 0d.–£1445 5s. 7d. plus travelling allowance on a mileage basis.

Application forms and conditions of appointment may be obtained from the Medical Officer of Health, 2, Church-street, Southport. Completed applications to be sent to the undersigned to arrive not later than 5th November, 1955, and envelopes to be endorsed "Deputy Medical Officer of Health" in the top left hand corner.

Town Hall, Southport. R. EDGAR PERRINS, Town Clerk.

**ST. HELENS. COUNTY BOROUGH OF ST. HELENS.** HEALTH DEPARTMENT. Applications are invited from qualified medical practitioners for the post of ASSISTANT MEDICAL OFFICER OF HEALTH (Male or Female) at a salary of £975 p.a., rising by annual increments of £50 to £1375 p.a. Recognition may be given to past Local Authority service in fixing the commencing salary. The possession of a C.P.H. or D.C.H is desirable, but not essential. Consideration for housing accommodation will be given according to the circumstances of the successful candidate.

Application forms and further particulars of appointment may be obtained from the undersigned.

G. O'BRIEN, Medical Officer of Health.

Town Hall, St. Helens, Lancs., October, 1955.

## Miscellaneous

*To non-professional posts the Notification of Vacancies Order 1952 applies*

**Mayfair Practitioner with extensive private and State** registered practice, requires full-time Assistant, preferably between 27 and 33 years of age. View to eventual partnership.—Address, No. 169, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

**The Society of Medical Officers of Health invite applications** for the post of Medical Secretary (part-time). The salary offered is within the scale £750–£1000.

Applications, endorsed "Medical Secretary" and containing full details of the applicant's professional career, should be forwarded to the Medical Secretary, SOCIETY OF MEDICAL OFFICERS OF HEALTH, Tavistock House South, Tavistock-square, W.C.1, and must be received not later than 15th December.

**Senior Psychiatrist. Eligible for State License in Maine,** to join staff of Pownal State School, New Gloucester, Maine. Dynamically oriented staff. Departments of Education, Clinical Psychology, Psychiatric Social Work, O. T., full-time Chaplaincy, Pathologist, Dentist, Res. Lab. Salary depending on qualifications. Numerous State benefits.—Apply to Superintendent, Box C, Pownal, Maine, U.S.A.

**"Pregnancy Diagnosis by the Xenopus Method," 24-hour** service. Send specimen of urine and £1 1s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

**Applicants for posts requiring testimonials copied or** duplicated should communicate with MANTON SECRETARIAL SERVICE LTD., 98, Victoria-street, S.W.1 (Phone: VICtoria 0141), who are specialists in this kind of work.

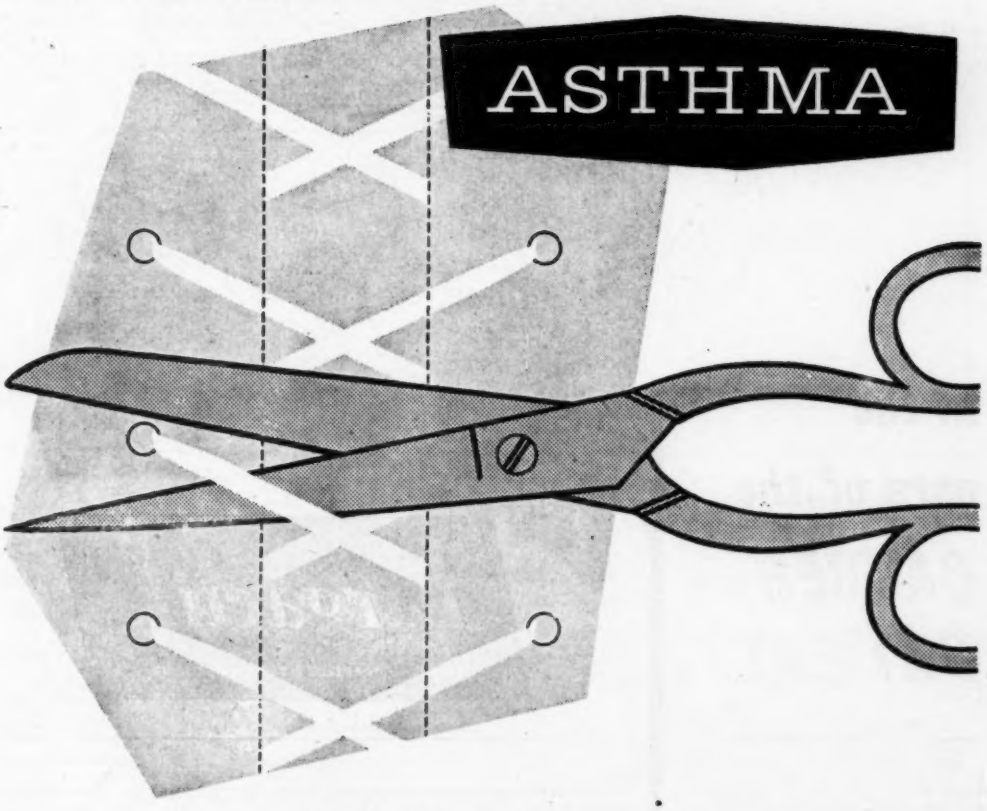
**Typewriting and Duplicating. First-class work at moder**ate prices by experienced medical typists.—SYBIL RANG, 21, Heath-street, Hampstead, London, N.W.3 (HAM. 5329/0504).

**Austin. The New Show Models A.30, A.40, A.50, and A.90.** Limited number of deliveries now available to proven essential users.—Demonstrations, brochures, easy terms, application forms, on request from H. A. SAUNDERS LTD., Austin House, 140–144, Golders Green-road, Golders Green, N.W.11.

**Half Skeleton for Sale, in excellent condition.—Address,** No. 172, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

PUBLISHED by the PROPRIETORS, THE LANCET LIMITED, 7, Adam Street, Adelphi, in the County of London.
Printed by HAZELL, WATSON & VINEY, LTD., London and Aylesbury—Saturday, October 22, 1955.
PRINTED IN GREAT BRITAIN—Entered as Second Class at the New York, U.S.A., Office.

# for symptomatic relief of

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*Benazma is recommended for the relief of nocturnal cough in asthmatics, and for those patients undergoing specific desensitisation for asthma.*

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| Pseudo-ephedrine hydrochloride .. | 1 grain |
| Ext. Stramon. Liq., B.P. .. .. | 1½ minims |
| Syr. Pruni Serot., B.P. .. .. .. | 1 fluid drachm |
| Syr. Codeinae Phosph., B.P.C. .. .. | 1 fluid drachm |

*Bottles of 8, 20 and 80 fluid ounces*

BENCARD

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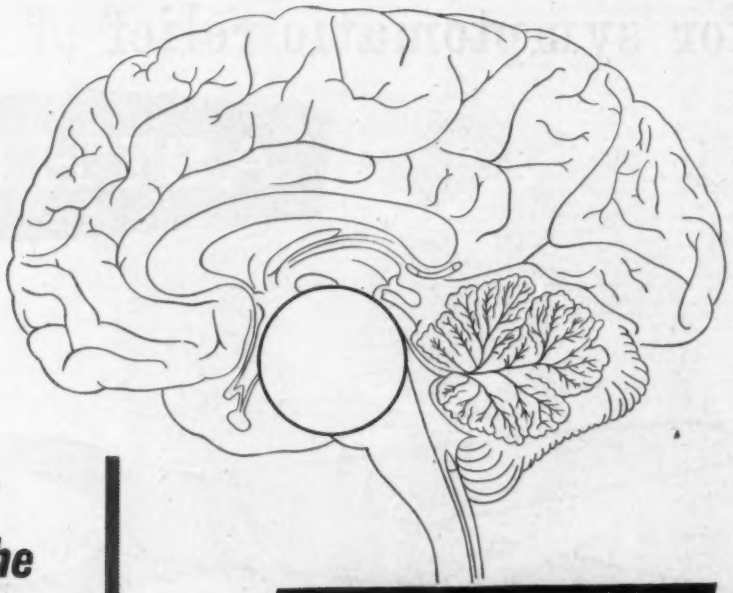

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